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Lumleian Lectures

ENTITLED

A MEDICAL REVIEW OF THE SURGERY OF THE CHEST.

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BY R. A. YOUNG, C.B.E., M.D., B.Sc. LOND.,
LLOW OF THE COLLEGE; SENIOR PHYSICIAN TO THE MIDDLESEX
HOSPITAL; PHYSICIAN TO THE BROMPTON HOSPITAL FOR
CONSUMPTION AND DISEASES OF THE CHEST.

LECTURE II.*

(Delivered on March 21st, 1929.)

THE surgeon and the bronchoscopist seem destined take an increasing share in the treatment of severe lmonary disease. This is more particularly to be pected in cases where medical measures are applicable, where they have failed, or where they quire surgical aid to promote their actions. Some of the most striking applications of surgery this department of medicine have occurred in nnexion with pulmonary tuberculosis, and it will erefore be convenient to deal with these first.

SURGERY IN PULMONARY TUBERCULOSIS.

The earlier applications of surgery in this disease ere chiefly directed to the drainage of cavities and o removal of diseased areas of lung. To some of ese I have referred in my first lecture. They were urageous attempts, but though successes were corded, they did not lead to advances because they alt with effects and failed to influence the primary sease and its spread. They were pioneer efforts, d the historical surveys given by Stephen Paget i d by Rickman Godlee[2] make interesting reading. few chest surgeons are even now in certain cases vising drainage of some cavities which fail to close collapse methods.

Modern surgical methods in this disease are the tcome of the combined experience obtained by rgeons in the treatment of chronic empyema and at of physicians in the use of artificial pneumo-orax as a therapeutic measure. Although these have ogressed practically concurrently, thoracoplasty in ipyema antedated collapse treatment in tubercu-is. To Ludolph Brauer and Lucius Spengler belongs d credit of correlating the two methods. The story of collapse treatment has been admirably scribed by Clive Riviere,[3] Morriston Davies,[4] and exander.[5] Only a brief review is here necessary order to point out the way in which the present actice has been developed. The untimely death Clive Riviere is deeply to be deplored. In this untry the application of combined medical and rgical treatment owes much to his clear and critical iblications, his careful and considered application these methods, and his wide experience of them. y own indebtedness to his writings will be apparent.

After Carson's original suggestion the idea lapsed, d its eventual realisation succeeded only after ow and gradual groping. Houghton, in 1832, noted e beneficial effects of spontaneous pneumothorax an advanced case of phthisis. Stokes, in 1837, rites as if this were a well-recognised sequence. oussaint, a pupil of Potain's, stressed, in 1880, the nprovement after spontaneous pulmonary collapse. n 1884 Potain[6] himself replaced an effusion with erilised air, the first gas replacement on record. le used a manometer to control the pressure, and in 888 recorded two other cases in addition. Meanhile, in 1882, Forlanini had suggested artificial neumothorax as a form of treatment of pulmonary uberculosis, though he seems to have waited until 1888 before actually trying it, and delayed publication of his results until 1894–95. Cayley's attempt to stop hæmoptysis by open pneumothorax took place in 1885. Forlanini and Potain seem therefore to be the first successful pioneers of practical artificial pneumothorax methods. J. B. Murphy[7] in 1895, independently applied this method of collapse treatment, and by 1901 his pupil, Lemke, was able to record 53 cases. Schell, of Indiana, in 1899, was the first after Cayley to apply the method deliberately to the treatment of hæmoptysis. A noteworthy advance was the addition of a water manometer to the apparatus by Saugman in 1904. The adoption of the method in Germany by Brauer was also to prove fruitful. He reported his cases in 1905–06. The credit of introducing the method into England is due to Colebrook, Lillingston, Pearson, and Rhodes in 1911. Although this country was late in the field, and the general adoption of this method as a routine treatment for selected cases was tardy, a great deal of useful work has been done and good results have been obtained. Dr. Clive Riviere's[8] book and the report to the Medical Research Council of Dr. Burrell[9] and Dr. MacNalty have both helped to this end in great measure.

The surgical attempts to induce collapse started even before the medical. Estlander,[10] in 1879, introduced his method of endeavouring to close chronic empyema cavities, and applied the name of thoracoplasty to it. Schede introduced the method of large lateral resections for the same purpose. The first actually to apply this principle to the tuberculous lung was de Cerenville,[11] of Lausanne, in 1885. He removed parts of the upper ribs in four cases with excavation, at the same time draining the cavity in two of them. He therefore slightly antedates the practical application of artificial pneumothorax, though not Potain's gas replacement. He was followed in this operation by Quincke, who, in 1896, advised its use in cases without excavation. Meanwhile Spengler applied the same method to cases with pleural effusion and applied the name of "extra-pleural thoracoplasty." He employed a periscapular incision and his rib resections were more extensive. Garré and Quincke, in 1903 and 1905, suggested thoracoplasty, with or without pneumolysis, for hæmoptysis. It soon became apparent that the resections carried out by these surgeons were not extensive enough. To the physician, Brauer, is due the credit of recognising that if thoracoplasty were to be of value as a supplement to, or substitute for, artificial pneumothorax, it was necessary that sufficient lengths of the ribs should be removed to secure a degree of collapse approaching that obtained by it. The outcome of this was the Brauer-Friedrich operation, carried out by a large horseshoe-shaped incision similar to that of the Schede operation for empyema. This was first performed by Friedrich for Brauer[12] in 1907. Lengths varying from 10–25 cm. were removed from all the ribs from the second to the ninth. In later operations parts of the first rib and of the tenth were also removed. This extensive decostalisation proved dangerous from the shock involved, and disappointing in its effects, since "flutter" of both the mediastinum and of the chest wall sometimes resulted, the operation thus failing to keep the affected side at rest and impeding the effective ventilation of the sound side. Aspiration pneumonia frequently resulted, and there was a very high mortality. Alexander, to whose interesting account of the history I am much indebted, points out the remarkable experimental work done by Gourdet,[13] in 1895, after an operation performed by Boiffin for empyema in 1894. Gourdet demonstrated the much greater effects in diminishing the size of the hemithorax, of removal of parts of the ribs posteriorly, especially if the removal extended to the transverse process of the vertebræ. This mode of removal is generally referred to as paravertebral.

It was not until 1911 that the results of this imp[illegible]ant experimental work were applied [illegible] of thoracoplasty. In [illegible] Wilm[illegible] ...

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ious danger of cutting through a piece of lung wn out into an adhesion, thus leading sometimes pyopneumothorax. Simple pleural effusion and cutaneous emphysema are also not infrequent nplications, though less serious. In my opinion, s operation, ingenious as it is, has only a limited fulness. Morriston Davies at one time cut hesions by means of a tenotome introduced through intercostal space, the section being controlled by ray observation, but now uses Jacobaeus's method. e third method which has been suggested is by en thoracotomy—the operation being called open rapleural pneumolysis. This is now rarely carried t, as it also involves the risks of effusion and pyema.

Extrapleural Pneumolysis.

In view of the ease with which the parietal pleura n be stripped from the chest wall, it is not sursing that this method has been proposed to permit ther collapse. It was first attempted by Tuffier,[21] 1891, as a preparation for resection of part of the g. Schlange, in 1907, performed a similar operation d filled up the space between the chest wall and the x with iodoform gauze. Tuffier, in 1910, used as a filling. Since that time various substances ve been used to fill up the gap and exert pressure on the lung. Among these may be mentioned afts of fat, muscle, and breast. Paraffin has been ed and sometimes with success.

Attempts have also been made to keep up an trapleural closed pneumothorax. Although these erations are theoretically admirable, their results usually disappointing. It is often difficult to a living filling sufficiently large to accomplish the ject desired. Non-living fillings like paraffin are ble to lead to inflammatory effusion and then to trude. This operation is most often carried out the apex, when it is called apicolysis.

Phrenic Evulsion or Exairesis.

The credit of introducing the principle of paralysing e phrenic nerve in order to allow the diaphragm encroach on the thoracic space with a view to sisting collapse belongs to Stuertz,[22] who, in 1911, oposed and carried out this operation for tuberlosis and bronchiectasis. Sauerbruch at the same ne carried out a similar operation independently. e results were found to be disappointing until, 1922, Willy Felix [23] investigated the anatomy of is nerve in detail. It was then found that it was tremely variable. It is often duplicated in the ck, and occasionally arises in three separate unks. It receives fibres from other nerves, including e nerve to the subclavius muscle, the hypoglossal, e spinal accessory, vagus, and sympathetic. Felix, the suggestion of Thiersch, first carried out the eration of evulsion or exairesis. The nerve is posed in the neck under local anæsthesia and vided. The distal end is slowly twisted round the rceps, and as much as possible is drawn out. Somemes the nerve and its branches can be drawn out most entire, at others only a short length can be vured. The amount removed varies from 3 to or even 18 inches. Although it would appear at the diaphragmatic excursions are a minor ctor in pulmonary ventilation, being responsible nly for one-sixth to one-eighth of the vital capacity, ralysis of one side of the diaphragm allows of nsiderable ascent of that structure into the thorax.

This operation is proving to be of very real value n a variety of conditions. These are clearly tabuted in two excellent papers by Morriston Davies.[24] some cases of active basal tuberculosis, it turns e scale in favour of arrest. In extensive unilateral sease it may exert a favourable influence. As an cessory to artificial pneumothorax it has a wide ld of utility. It can supplement an incomplete neumothorax and render it effective. It can be sed to check the pleural effusions which so frequently ccur in the course of pneumothorax treatment, and t may assist in increasing the period between refills. In cases where the lung fails to expand when artificial pneumothorax is terminated, it may help to close the space left, though thoracoplasty may be necessary to complete the obliteration. It may be a very valuable addition to thoracoplasty. Sauerbruch carries it out beforehand as a test of the capacity of the sound lung to stand the strain imposed by the major operation. It is my almost invariable practice to have this operation done before thoracoplasty since, in a few cases, it may render this unnecessary, and I like to give the patient this chance. It is often of use in alleviating distressing symptoms, such as vomiting after cough, hiccough, and the drag on the heart from marked displacement due to fibrosis. The risks of the operation are slight. Great care should be taken to identify the nerve, as on four recorded occasions the vagus has been cut instead, with fatal result in each case.

Obliterative Pneumothorax.

Another cause of failure in artificial pneumothorax is rapid spread of adhesion between the visceral and parietal pleura. Oleothorax, which will be described in connexion with pleural disease, promises to be of use in preventing this.

ABSCESS AND GANGRENE OF THE LUNG.

Intrapulmonary suppuration results from such a variety of causes that it is not surprising that its causation and treatment are both the subject of considerable controversy. At the outset it is well to exclude bronchiectatic collections, although the two conditions are often associated, since abscess may lead to bronchiectasis and bronchiectasis may cause definite abscess formation. Theoretically, interlobar empyema has also to be distinguished from lung abscess, but the distinction is often only possible at operation.

The classification of cases of abscess and gangrene is also a difficult task. The two conditions can with difficulty be distinguished clinically, and are often associated together. In gangrene there is a larger degree of putrefactive necrosis and greater fœtor with a larger proportion of anaerobic organisms. Recent researches suggest that in many cases they are only degrees or varieties of the same infective process, and that the important factors determining the onset of gangrene are the increased virulence of the organisms or the diminished resistance of the individual. Pressure by growth or aneurysm on a large branch of the pulmonary artery may also determine the development of gangrene. A tentative working classification is: (1) Cases originating in the bronchi. These are chiefly due to aspiration of infected material, either in association with inhaled foreign body or during unconsciousness from anæsthesia or other causes. (2) Parenchymatous. These are often single and may follow pneumonia or other infective processes. This condition is referred to as a "pneumonitis" by some American authors. At the same time, it should be recognised that it is rare in pneumococcus pneumonia apart from secondary infection by pyogenic organisms. (3) Embolic. These are often multiple and may be associated with septicæmia or right-sided infective endocarditis, or with local septic conditions at a distance—e.g., otitis media, appendicitis, or infective thrombo-phlebitis.

The striking feature brought out by some American statistics is the frequency of pulmonary abscess after tonsillectomy, and its association with oral and nasal sepsis. In 105 cases studied by Lilienthal, pneumonia (including influenza) was given as the cause in 29, tonsillectomy in 21. Whittemore [25] found 61 per cent. of 86 cases of abscess preceded by operation on the upper respiratory tract. Wessler [26] states that 28 per cent. of all cases of lung suppuration examined in the X ray department of the Mount Sinai Hospital, New York, arose after operations on the mouth, tonsils, or pharynx. Frederick Moore says the pulmonary abscess occurs once in every 3000 tonsillectomies. There is considerable dispute as to

The treatment of gangrene of the lung depends upon the cause. If it is due to actual vascular pressure or occlusion, operation should not be advised. If it can be proved to be fuso-spirochætal in origin, arsenical injections can be tried. In circumscribed gangrene surgical methods offer the only chance of success.

Tumours of the Lung.

Innocent tumours of the lung are rare, and for the most part they are pathological curiosities. It is only when they cause pressure on the bronchi or on the mediastinal structures that surgical treatment comes under consideration.

Primary malignant tumours of the lung most often commence in the bronchial mucous membrane, and are rarely recognised until they give rise to symptoms from bronchial obstruction or from mediastinal pressure owing to secondary glandular involvement. They are therefore but rarely amenable to surgical removal. There is, however, one form of malignant growth of the lung in which lobectomy is practicable, and in this type it has already given encouraging results. This is that in which the primary growth originates in the lung parenchyma at a distance from the hilum. Lobectomy in a lung which is free from septic infection is an operation with a low mortality, and there is now a definitely evolved technique for its performance. It is surprising how little shock may occur, and remarkable how quickly the parts of the lung left behind can expand to fill the cavity resulting from the excised lung area, unless this is very large, when phrenic evulsion and even partial thoracoplasty may be necessary.

Systematic routine early X ray and bronchoscopic examinations of cases of obscure chest disease, especially those with unexplained, irregular, or suspicious hæmoptysis, are desirable, since if a localised lung growth of this kind can be recognised at an early stage, the patient should be given the chance of an exploratory thoracotomy with a view to lobectomy, if practicable. The outlook in cases of growth of the lung is at present so gloomy that the least chance of improvement should be seized.

Surgery in Bronchial Conditions.

The chief conditions of the bronchi which may be aided by surgical methods are: (1) inhaled foreign bodies, (2) new growths, (3) bronchial fistula, (4) bronchiectasis.

Foreign Bodies.

This question was fully dealt with in the Lumleian Lectures for 1924 by Dr. Thomas McCrae.[33] The pioneer work in the bronchoscopic removal of foreign bodies by Chevalier Jackson has revolutionised the treatment for this accident, to the great advantage of the patients.

Bronchial New Growths.

The bronchoscope has also proved of great value in removing some forms of simple tumour arising in the main bronchi and their chief branches. An interesting paper by Myerson[34] gives a description of a case treated by this means with an analysis of cases recorded by others. Mr. Somerville Hastings[35] has pointed out that a few malignant tumours have been successfully removed through a bronchoscope, while others have been treated by radium introduced or applied by this means. The bronchoscope is proving of increasing value, both in diagnosis and treatment, and its value in both these respects should be more widely recognised in this country.

Bronchial Fistulæ.

These are usually the result of disease or injury of the lung, or of operative procedures used in their treatment. Many of them heal spontaneously, but for others some form of plastic surgery may be necessary. Under certain conditions, notably in bronchiectasis or chronic abscess, they may serve a useful purpose and be retained deliberately.

Bronchiectasis.

Many forms of surgical treatment have been suggested in this disease. Some have already been discarded, and the general results of surgical intervention can hardly be regarded as encouraging, though successes occur which justify operation in selected cases. The ætiology of the condition is so complex that the indications for surgical treatment are difficult to define. Cases which are obviously due to some removable or remediable condition of a bronchus or of the lung tissue in its neighbourhood, such as those described under abscess of the lung and those resulting from inhaled foreign body, are the most likely to benefit. These are often called chronic bronchiectatic abscesses.

Those in which the disease starts early in life are often slowly progressive. In early stages they may be assisted by surgery, but they must be treated before they extend to the opposite side. At present all bilateral cases are inoperable. In cases where there is progressive suppuration leading to destructive changes in the lung tissue around, surgery may be considered, but the risks must be very carefully weighed before a decision is made. The general condition of the patient must also be very thoroughly investigated. Medical measures may in such cases palliate and restore a tolerable state of comfort to the patient, but too often they fail. Bronchoscopic lavage is now proving a valuable adjunct to medical treatment, though it rarely leads to cure. Artificial pneumothorax naturally comes into consideration in unilateral cases. If an efficient collapse of the lower lobe can be obtained, this treatment is worth keeping up, but as a rule it has to be continued indefinitely, since the symptoms usually return when the lung is allowed to expand again. If all these measures fail and the condition of the patient warrants it, surgery may be considered, but only after careful lipiodol investigation. Time should be allowed after this to permit of the expectoration of most of the lipiodol before operation.

The chief surgical operations which have been suggested in the treatment of bronchiectasis are:

1. Draining the cavity by *pneumotomy* as in abscess. This is clearly only suitable where there is a single large cavity. The patient is generally left with a small bronchial fistula, which may eventually close or be closed, though it may be desirable to keep it open.

2. *Ligature* of the branch of the pulmonary artery to the affected lobe was tried in some cases since it leads to fibrosis. This has proved to be of little ultimate value, and is practically no longer employed.

3. *Phrenic evulsion* is worth a trial in basic cases. It helps in the expectoration of the sputum, and in some cases it may lessen or even stop the fœtor. It is also of great value as a preventive of bronchiectasis after abscess of the lung. There is reason to hope that its employment in cases of unresolved pneumonia and other causes of bronchiectasis may prove to be a valuable preventive measure, if the early dilatation is recognised and the operation promptly carried out.

4. *Thoracoplasty.* Rib resections of sufficient extent to cause collapse of the affected lobe or lobes are carried out, usually in stages. Hedblom carries out what he describes as a graded thoracoplasty. A number of successful cases have been recorded in this country, notably by my colleagues, Mr. J. E. H. Roberts[36] and Mr. A. Tudor Edwards.[37] It should be remembered that in many cases the lung tissue is more densely fibrous than in cases of pulmonary tuberculosis, and that the dilated bronchial tubes are not likely to empty and collapse like the vomicæ of that disease. In consequence, the results are on the whole less often satisfying than in tuberculosis, but many patients have been restored to comfort and working capacity.

in 1922 collected 17 cases of cinchophen poisoning, the most prominent symptoms being an urticarial eruption, with or without œdema, albuminuria, fever, headache, malaise, and gastric intestinal disturbances; in two cases there were also cardiac symptoms. He reported symptoms of poisoning even with small doses. Recently 20 cases of jaundice attributed to poisoning by cinchophen have been reported by Worster-Drought [47] and others.[53-62] Omitting one case of which clinical details are not available, and a second [53] attributed to atoquinol, 18 cases of jaundice following the administration of cinchophen have been reported, seven of which were fatal. In three cases the symptoms were those of icterus gravis, and at autopsy the livers showed acute yellow atrophy. From a study of the individual cases it is evident that the symptoms of poisoning occurred after therapeutic doses, except in three cases [57-59] in which considerable doses of cinchophen were taken over long periods without medical supervision; in one of Loewenthal's [62] cases the drug was taken in therapeutic doses, but without medical supervision. Schroeder,[16] however, in a study of the harmful secondary effects of cinchophen, has made no mention of the occurrence of jaundice.

Two fatal cases of acute yellow atrophy after the administration of biloptin have been recorded,[63] [64] and four cases of jaundice which recovered.[63] [65-67] Biloptin, however, being an iodised form of cinchophen, the consideration of these cases does not come within the scope of this paper.

Gastro-intestinal Tract.—Cinchophen, being an acid, causes local irritation and gastric distress in susceptible individuals, or when given in large doses. Hanzlik and others [36] [68] observed toxic symptoms following its administration in very large doses. Absence of gastric distress after doses up to 7 g. daily of neocinchophen (tolysin) was reported by Barbour, Lozinsky, and Clements,[37] and by Chace, Myers, and Killian.[38]

In our experience, using therapeutic doses, symptoms of gastric irritation, varying from a sense of epigastric discomfort to acidity and heartburn, are the commonest expression of intolerance to cinchophen. These symptoms can be controlled in the majority of cases by giving water with the drug, and grs. 15 of sodium bicarbonate; though their presence requires very careful observation of the effect of the drug, it does not necessarily indicate its disuse.

A more marked condition of gastric irritation was seen in a woman aged 66 (Case 4), who suffers from tophaceous gout with recurrent acute attacks. On repeated occasions a single tablet (0·5 g.) has caused symptoms of gastric distress and severe malaise lasting three hours.

Such symptoms as these are likely to prevent anyone from continuing to take the drug, but there are others which are of greater importance, because they are a warning of a toxic effect on the liver and are more insidious in their onset.

Liver.—The first definite symptom of liver poisoning is a loss of appetite. Once its significance is realised there is no mistaking this symptom, for the patient who normally has a good appetite loses it, and develops a distaste for food which is a remarkable and unaccountable experience to him. This symptom was marked in one of our cases: if we had realised its importance immediately and had stopped the drug, the jaundice which subsequently developed could probably have been prevented.

Lethargy and somnolence precede the development of jaundice. Thus in one patient there was unaccountable sleepiness, and she was inclined to fall asleep at any time of the day that she sat down to rest. The symptom was recognised at once as a sign of liver poisoning and the drug was discontinued, but it was too late to prevent the subsequent development of jaundice. Jaundice has been observed in four cases, and it has developed very gradually; it may not appear until a week or two after discontinuing the drug. Associated with jaundice there is considerable malaise, which persists in gradually diminishing degree for a period of months after the jaundice has disappeared.

Three of these cases have already been briefly reported,[54] and the following note is of a more recent case.

CASE 5.—Brewer's drayman, aged 53, was admitted to St. Bartholomew's Hospital on July 15th, 1927, complaining of jaundice. For about 30 years he had suffered from pains in the joints of the feet, and one year before admission he began to have pains in the knees, hips, and hands. Two months before admission he came up to hospital, and the diagnosis of gout was made. He was treated as an out-patient with cinchophen, 0·5 g. three times daily for four successive days of each week. As a result of treatment his pains disappeared, and he was able to walk about unaided, which he could not do previously. Three weeks before admission he felt "out of sorts," and suffered from lassitude, anorexia with occasional vomiting, drowsiness during the day, and insomnia at night. A week later he was seen, and the administration of cinchophen was discontinued immediately. One week before admission jaundice began to appear.

Past History.—Except for his joint trouble he had been previously healthy. There was no history of syphilis. He drank about three pints of beer daily.

Condition on Admission.—The patient was a heavily built man, the skin and sclerotics deeply jaundiced. The temperature was normal. The tongue was furred, and there was considerable dental sepsis. There was a scaly papular rash over the chest and back. The heart and lungs were normal; the blood pressure 130 systolic, 90 diastolic; pulse 60. The liver was palpable about 1 inch below the right costal margin, but there was no tenderness and no ascites. The movements of the hips and ankles were appreciably limited, and there was ankylosis of the metatarsophalangeal joints of both great toes. The urine contained a trace of albumin and a large amount of bile-pigments. Hay's test for bile-salts was negative; red blood cells, 4,880,000; white cells, 15,600; and hæmoglobin, 84 per cent. The van den Bergh reaction direct was strongly positive, indirect 7 units of bilirubin. X ray examination of the stomach revealed nothing abnormal. The glucose-tolerance test was positive, the blood-sugar one hour after the administration of 50 g. of glucose by mouth being 185 mg. per 100 c.cm., and two hours after 170 mg. per 100 c.cm. The urinary diastatic index was 10 units. Blood uric acid 5·3 mg. per 100 c.cm. The Wassermann and Sigma reactions were negative.

Course.—During his stay in hospital the patient developed epigastric pain, which would come on practically every day and last for one or two hours; it was usually relieved by a carminative mixture. The stools were pale, but never clay-coloured. Two weeks after admission his condition improved, and his jaundice began to clear; on August 25th, 1927, he was discharged, the jaundice having almost disappeared, and his liver being barely palpable. Since then he has been under observation and has very gradually recovered his strength.

Kidneys.—Except for the appearance of a transient trace of albumin associated with other severer symptoms of poisoning, we have not observed any signs of renal damage. This agrees with the observations of Barbour, Lozinsky, and others.[3] [37] [38] Hanzlik and others,[36] however, found that cinchophen in the large doses given in the treatment of rheumatic fever (total dosage 4–19 g.) caused albuminuria and sometimes the appearance of casts and white blood cells in the urine of the majority of seven individuals that were observed. Similar findings were reported by Boots and Miller,[68] using neocinchophen.

Skin.—Skin rashes are referred to by other authors, and we have only observed a skin rash in one instance (Case 5).

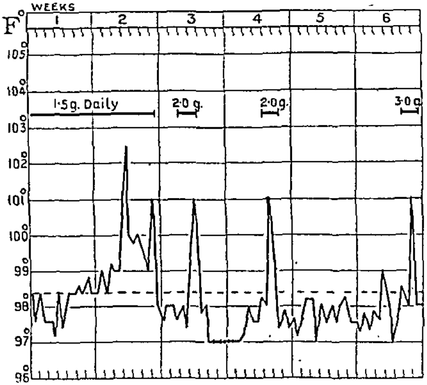
Circulation.—According to Hanzlik [69] small therapeutic doses of cinchophen do not affect the circulation demonstrably except in susceptible individuals, who respond with some acceleration of the pulse and consciousness of the præcordium. Vasomotor depression after therapeutic doses has been observed independently by Barron [70] and Scully.[71]

The following case is an example of cardiovascular disturbance due to cinchophen.

CASE 6.—A man, aged 62, was first seen on Nov. 6th, 1925, recovering from an acute attack of gout in his right foot. He was in good health apart from his gout; he had a clear complexion and a clean tongue; heart and lungs normal; B.P. 160/94; urine normal; there was a family history and past history of gout. Cinchophen with sodium bicarbonate was prescribed. He took cinchophen, 6 g. per week for a period, and then reduced the dose to 5 g.; he continued on this dose until September, 1928, when he was seen again on account of loss of weight (actual loss 9 lb.), dizziness, a feeling of his le giving way as he walked, and of occasional "frightful thumping" in the heart, radiating to the left side of the neck and left temple. His appetite and digestion were good; bowels natural, stools a little pale, and not quite formed; sleep good; no depression. Cinchophen was stopped and sodium bromide in an alkaline mixture was prescribed. Following this treatment his symptoms quickly subsided, and when seen again on Nov. 27th he felt well. Associated with this attack of cardiovascular disturbance attributable, in our opinion, to cinchophen, there was no change in his pulse-rate or diastolic pressure.

Metabolic Effects.—The following case illustrates a somewhat unusual type of cinchophen poisoning, and in this patient the administration of the drug was cautiously persevered with in spite of its toxic effects because of the very definite improvement in the arthritis which resulted from its administration.

CASE 7.—A nurse, aged 43, was admitted to St. Bartholomew's Hospital on Jan. 27th, 1927, complaining of pain and stiffness of both knees. Ten years previously she had had pain in the metacarpophalangeal joints of both hands, followed by pain and stiffness in both shoulders, elbow, and wrist-joints. Six years later she developed similar pain in the right knee and ankle, and one year before admission the left leg and both hips became similarly affected. She had been bedridden for 12 months.



Temperature chart for six weeks in Case 7. The discontinuous line shows the periods during which cinchophen was administered, the daily dose being as stated.

Condition on Admission.—Her general condition was good and there was no clinical evidence of sepsis. There were tenderness and limitation of movement of the shoulder, elbow, wrist, knee- and ankle-joints. There was marked ulnar deviation of the fingers and slight spindle-shaped swelling of the proximal interphalangeal joints. The knee-joints were slightly swollen and fixed at an angle of about 120 degrees. The urine was normal. The blood uric acid was 4·0 mg. per cent. A test-meal showed a trace of free hydrochloric acid. An X ray examination of the affected joints showed absence of cartilage, new bone formation, and areas of bony rarefaction. The diagnosis of gout was made.

Course.—In addition to the application of massage, radiant heat, and extension to the legs, the patient was treated by the oral administration of 0·5 g. of cinchophen three times daily. On the ninth day after the initial dose the proximal interphalangeal and metacarpophalangeal joints of both hands became hot, swollen, and very painful, and on the following day the temperature rose to 102° F. (vide temperature chart attached); there was well-marked general malaise, but the joint pains became less severe. During the next two days the temperature fell gradually to 99°, but rose again the following day to 101°. She suffered from anorexia and nausea, and the cinchophen was discontinued (April 1st).

On April 4th 0·5 g. of cinchophen was given four times during the day, and on the following day the temperature rose to 101° F., but subsided on discontinuing the cinchophen. While taking cinchophen she suffered from nausea, malaise, and general pains. Again on the 13th 2·0 g. of cinchophen were given during the day, followed the next day by pyrexia, nausea, and malaise. On the 25th 1·0 g. of a different preparation of cinchophen was given three times during the day, and she again suffered from nausea, malaise, and a rise of evening temperature, which subsided on the following day, when the drug was discontinued. On May 3rd much smaller doses of cinchophen were given; on this date she received 0·06 g., on the 4th 0·2 g., on the 5th 0·1 g., and on the 6th 0·06 g. The pain in the joints on the 6th was severe. Cinchophen was then discontinued for three days. On the 8th she vomited on two occasions. On the 10th 0·06 g. cinchophen was given once daily for three days and discontinued for three; this was tolerated. On the 16th she received 0·1 g. daily for three days in the same way; on the 17th there was remission of pain, but on the 21st the pain in the left knee was severe, and she experienced a certain amount of nausea. She continued to take 0·1 g. cinchophen daily three successive days of the week, but during the whole of the time while taking it she suffered from nausea and pain in the joints. An attempt to increase the dose of cinchophen to 0·1 g. two or three times daily caused slight malaise, nausea, and a little more pain in the joints, but no fever. On June 22nd she was discharged from hospital with instructions to take 0·06 g. cinchophen twice daily.

The result of this persistent use of cinchophen was a gradual and steady improvement in the arthritis with a temporary setback on each occasion that poisoning symptoms occurred. The ultimate result, however, was very good, and the patient was able to walk out of hospital, though still considerably crippled. Local treatment by massage, radiant heat, and extension applied to both legs contributed to her recovery.

Since her discharge from hospital and after a period of time cinchophen was discontinued and colchicum given in its place. Progress has continued, and she is now able to walk up and down stairs and do a little housework, though her knee-joints are still very stiff.

Idiosyncrasy to Cinchophen.

Several of the cases reported in this communication (Cases 4, 5, and 7) are examples of idiosyncrasy to cinchophen. In one of these (Case 7) cinchophen in small quantities was responsible for an exacerbation of general and joint pains. We have seen this also in a man, aged 66, who has suffered from chronic gout for a number of years.

In his experience cinchophen brings on an attack of acute gout; this sequence of events has happened eight times and is associated with gastric and intestinal disturbance. The patient himself has tried the drug perseveringly, because a single tablet relieves him to some extent of "rheumatic" pains in the thighs. He has tried taking one tablet on alternate days, and also at longer intervals, and has discovered that his maximum tolerance of the drug is one tablet (0·5 g.) taken once a week. His statement of the present position is that he always keeps it by him, and takes one tablet now and then, but he is nervous about using it, because he would rather have chronic pains than an attack of gout.

A familial idiosyncrasy to the drug is suggested by the fact that this man's sister developed jaundice after taking cinchophen.

Two of the cases already reported[54] as having developed jaundice after taking cinchophen are further examples of an idiosyncrasy to the drug; in the one case the symptoms developed after taking only 30 tablets, not more than 10 being taken in one week; in the other there was an idiosyncrasy to two different preparations, and vomiting, followed later by jaundice, occurred after taking only one or at most two 0·5 g. tablets.

Discussion.

The most important toxic effect of cinchophen is on the liver, because when the liver is damaged by cinchophen it is responsible for a severe illness from which recovery is slow. Further, in fatal cases of cinchophen poisoning, death is due to its effect on the liver and to the acute yellow atrophy that results. Yet in spite of the published cases of liver poisoning due to cinchophen Brugsch[72] maintains that there is no question of atophan being a liver poison when given in the usual doses, unless the patient has been on a carbohydrate poor diet and as a result has poor glycogen reserves in the liver. He is indeed so sure of the innocence of atophan as a liver poison that he uses it for the treatment of jaundice in subacute yellow atrophy of the liver, and also in cases in which jaundice is due to a catarrhal cholangitis with blocking of the papilla by a plug of mucus or by congestion of the duct. Weil[73] takes the matter further, and reviews the published cases of liver injury following the administration of atophan; he concludes "that only in the case of England and Holland, and in regard to quite individual cases, are there reports of injury to the liver following on continued use of atophan, while in Germany nothing is known about injury to the liver as a result of the continued administration of atophan." He goes on to say that "the few cases reported from England and Holland of liver disease following on the continued use of atophan are isolated and only have slight scientific foundation."

In view of the cases which we have placed on record in this communication, in some of which atophan was used, and in view of the experience of others recorded in writing, and to which we have given references, the opinions expressed by Brugsch and Weil need modification; and with regard to Weil's statement that nothing is known in Germany about injury to the liver as a result of continued administration of atophan, we feel bound to observe that it was known to the Schering Laboratory in 1924 that patients treated with atophan may "in very rare cases" react pathologically and develop "severe disturbances such as sickness and diarrhœa, *jaundice* and collapse" (the italics are ours).

Conclusions.

There can be no doubt that in cinchophen we have a drug which is often invaluable in the treatment of chronic gout, and in certain cases of this disease a cure can be effected, or great alleviation of symptoms obtained, such as cannot be effected by colchicum or any other means. Toxic symptoms of any severity rarely occur, and by a knowledge of the proper use of the drug we feel that even these can be avoided. At the same time it must be clearly recognised that toxic symptoms due to cinchophen do sometimes occur, and after relatively small doses, in those who have an idiosyncrasy to the drug.

Certain precautions should always be taken in prescribing cinchophen. A small initial dose should be given to test the patient's tolerance of the drug. It is given with water after meals, and if there is any symptom of gastric irritation, it is given with grs. 15 of sodium bicarbonate (cinchophen and sodium bicarbonate cannot be prescribed in the same mixture). It is generally best given, as Graham[9] has advised, on three days in succession each week, but there are occasions in our experience (as in Case 1) in which a smaller dose of cinchophen is more efficient and is well tolerated when distributed throughout the week; that some patients can take the drug continuously is proved by Case 3 in this series. When nutrition is poor and there is a suspicion of poor glycogen reserves in the liver, an ample carbohydrate diet should be given. Finally, any person taking cinchophen must be under medical supervision, and with the appearance of symptoms of liver poisoning, of which we believe a loss of appetite to be the first, the drug should be stopped at once. Case 6 is an example of the fact that toxic symptoms may arise in a patient who has already proved tolerant of the drug for a long time.

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THE FORMATION OF SALIVARY CALCULI AND THEIR TREATMENT.

BY CECIL P. G. WAKELEY, F.R.C.S. ENG., F.R.S. EDIN.,

ASSISTANT SURGEON AND LECTURER IN SURGERY, KING'S COLLEGE HOSPITAL; ASSISTANT SURGEON, BELGRAVE HOSPITAL FOR CHILDREN.

CALCULI in the salivary glands are most frequently found between the ages of 20 and 40. Men are affected to a greater extent than women in the proportion of three to one. The size of the calculi varies greatly; they may be as small as grains of sand or as large as a bantam's egg. Thorowgood demonstrated a specimen before the Pathological Society of London which measured 1½ in. in length and 2 in. in circumference. More commonly they vary from the size of a split pea to that of a date-stone. They are usually single and in a small percentage of cases only does recurrence take place after removal. As a rule, calculi in the glandular tissue are spherical or oval, while those in the ducts are elongated and resemble date-stones.

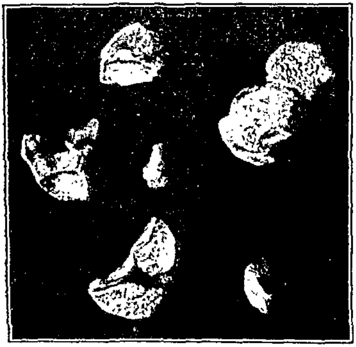
In the ducts they may be multiple and are then usually arranged end to end, the opposed surfaces being faceted. The surface of the calculus may be finely or coarsely granular and is usually of a dirty yellowish-grey colour. The structure varies considerably. In a fair proportion of cases a foreign body has been found as a nucleus. Some calculi are laminated, but in my experience this is rare. By far the majority of stones from the salivary glands and ducts are composed of calcium phosphate and calcium carbonate. A complete analysis of my last 12 cases of submaxillary calculi gives the following composition:—

Calcium carbonate	75·3	per cent.
,, phosphate	10·1	,,
Soluble salts	6·2	,,
Organic matter	6·1	,,
Water	2·3	,,

Ætiology.

The cause of calculus formation in the salivary glands and ducts has been, and still is, the subject of much discussion. That some constitutional condition may predispose to calculus formation seems very improbable. If a general cause was in any way responsible one would expect it to exert its influence upon more than one gland, and to give rise to calculi in several glands or ducts. As a result of carefully examining the very extensive literature on the subject I have been able to discover three cases only in which calculi have been found in more than one gland or duct in the same person. When foreign bodies form the nucleus no doubt they are the initial cause in the formation, as stones in the urinary bladder form round an unabsorbed catgut ligature. Foreign bodies, however, must not be regarded as the sole cause, nor must it be thought that any foreign body introduced into a salivary gland or its duct will of necessity cause the formation of a calculus. The literature abounds with cases in which a foreign body such as a piece of straw, grass, or hair has been lodged in the salivary ducts for long periods of time without giving rise to any calculus formation. Roberg, who investigated 47 cases of salivary calculi between the years 1896 and 1904, is of the opinion that foreign bodies are frequently present in the ducts of the salivary glands without the production of calculi.

FIG. 1.



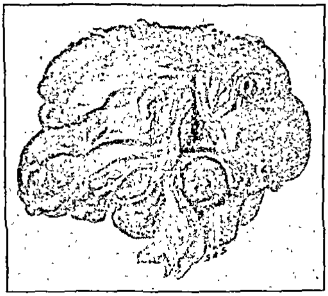
Multiple faceted calculi removed from the submaxillary gland (natural size).

An analysis of the recorded cases of salivary calculi published up to the present time brings out the following figures:—

Submaxillary gland and duct	63·2	per cent.
Parotid gland and duct..	20·6	,,
Sublingual gland and ducts	16·2	,,

It is necessary, therefore, to explain the far greater frequency of calculi in the submaxillary gland and Wharton's duct than in the other salivary glands and their ducts. It must be conceded that, owing to the greater size of the duct and the position of its orifice, foreign bodies such as tartar and particles of food can enter Wharton's duct more easily than they can the ducts of the other salivary glands. The composition of tartar is very *similar to that of calculi.* Therefore, although tartar may quite often be a determining factor, it would be quite impossible to demonstrate it. Similarly, food particles may enter the duct, undergo decomposition there, and simply add to the percentage of organic matter in the calculus without other evidence of their presence.

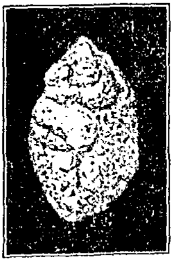
FIG. 2.



Calculus in submaxillary gland (natural size). The gland substance is very much fibrosed and thickened around the calculus.

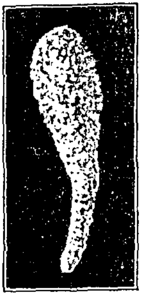
If a salivary calculus is carefully cut through its centre and a culture is made from the interior, bacteria are nearly always found. It might be thought that bacteria were the actual cause of the calculus, but this certainly cannot be the case, since, if infection alone were the important factor, calculi would occur more frequently in the gland and duct which are most often the seat of infection—namely, the parotid and its duct. Bacteria probably do play a part in the formation of calculi by decomposing the proteids in the saliva. It is a well-known fact that if saliva is exposed to the air for a short period of time carbon dioxide escapes

FIG. 3.



Calculus removed from submaxillary gland (one-third larger than natural size).

FIG. 4.



Comma calculus removed from the submaxillary gland and its duct (one-third larger than natural size).

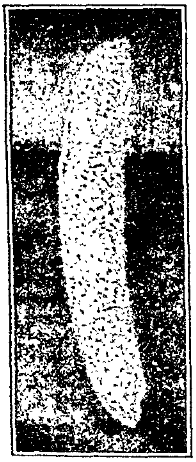
from it and a thin film of calcium carbonate soon forms on the surface. Therefore the removal of carbon dioxide alone is sufficient to precipitate the calcium salts. When bacteria decompose the proteids in saliva ammonia is produced, and probably immediately unites with the carbon dioxide held in solution; thus a condition favourable for calculus formation occurs. If this be so, it is quite reasonable to conclude that bacteria cause, indirectly, a precipitation of the calcium salts of the saliva by increasing the alkalinity of the saliva and removing carbon dioxide.

The composition of the saliva from the submaxillary gland allows easier precipitation of calcium salts than does that of the parotid or sublingual. The factors which predispose to a precipitation of the calcium salts in the submaxillary gland are: (1) high percentage of solids, (2) high percentage of organic matter, (3) greater degree of alkalinity, (4) low content of carbon dioxide.

It is sometimes debated whether the "idiopathic" formation of salivary calculi ever occurs. To me the question appears futile. If by the term "idiopathic" is meant that calculus formation occurs in a perfectly normal secretion in a perfectly normal gland or duct, the answer must clearly be in the negative. On the other hand, it does not seem necessary to postulate the entrance of any gross foreign material, since alterations in the reaction of a system of colloids and inorganic electrolytes are frequently accompanied by precipitation.

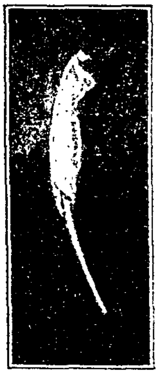
The lamination observed in the precipitation of certain salts in the presence of gels, and known as the Liesegang phenomenon, is profoundly influenced by the reaction of the gel. That variations in hydrogen-ion or hydroxyl-ion concentration in different media can be brought about by bacterial action is too well known to need comment. Hence the introduction of even a single micro-organism and its subsequent multiplication may set up such a disturbance in the equilibrium of an electrolyte-colloid system as to initiate precipitation. How far similar phenomena can be brought about by "filter-passers" is a question which time and experiment alone can solve. It is at any rate of theoretical interest, since these elusive entities are now considered to be important factors in the ætiology of influenzal and various catarrhal conditions. That colloids do play an important part in the formation of salivary calculi is at any rate suggested by their greater frequency in the submaxillary glands, where organic colloid material is present in the greatest abundance.

FIG. 5.



Calculus removed from Wharton's duct (one-third larger than natural size).

FIG. 7.

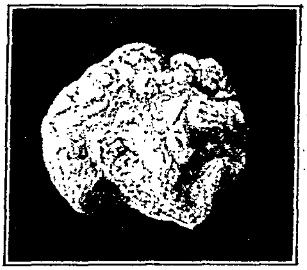


Calculus surrounding a small fish bone. It was removed from Wharton's duct (three times natural size).

Parotid Calculi.

Calculi are very rare in the parotid gland itself, Stenson's duct being much more frequently the seat of the formation. Multiple calculi are more common than single. Noehren, of Buffalo, reported a case in which 14 stones were removed from the parotid duct, and Townsend a case in which four stones were removed. Abscess formation around long-standing calculi is quite a common complication, and should the abscess open externally a fistula results. The masseteric portion of Stenson's duct is the most frequent situation for calculi, and their removal necessitates an external incision. Fistulæ may follow, but are rare if the incision is longitudinal and closed by stitches after the removal of the stones. If calculi be present in the premasseteric portion of the duct they may be liberated by an incision through the buccal mucous membrane.

FIG. 6.



Calculus removed from the orifice of Wharton's duct. It had been in this situation for over six months (one-third larger than natural size).

Submaxillary Calculi.

Calculi found in the submaxillary gland or its duct are usually single (Fig. 1). The single calculus may be seen in a variety of shapes according to the position in which it is lodged, either in the gland or in the duct. If it is in the gland it is usually rounded in appearance (Figs. 2 and 3), while if it is partly in the gland and partly in the duct it assumes a tapering form, the "comma calculus" (Fig. 4), the larger part of the calculus being in the gland while the smaller portion extends into the duct. This type is quite common, and the thinned distal portion is liable to be fractured and may then pass along the duct into the mouth, while the larger proximal portion remains in the gland. Such a calculus in the submaxillary gland cannot be palpated owing to the amount of fibrous tissue surrounding it, but it can nearly always be demonstrated by X rays. If, however, the calculus is in Wharton's duct it is usually moulded by the muscular wall and may be said to form a cast of the duct (Fig. 5). Lastly, if a calculus is formed at the orifice of Wharton's duct, or a small one passes along the duct and becomes impacted there, it is nearly always cylindrical (Fig. 6).

Many examples of calculi surrounding foreign bodies have been described. Perhaps one of the best examples of a specimen in the Royal College of Surgeons' Museum, No. 2234.1 (Fig. 7). It consists of a small fish bone which was found projecting from the orifice of Wharton's duct; it is encrusted with phosphates for more than half its length.

The treatment of submaxillary calculi is quite simple. Calculi in the gland usually necessitate excision of the gland, because there is always considerable fibrosis of the glandular alveoli due to the presence of the calculus and the back pressure exerted thereby. If the stone is in the duct an incision through the mucous membrane of the mouth into the duct is all that is required, and this can easily be performed under local anæsthesia. Calculi may re-form in either the gland or duct after an operation on the duct itself; oral sepsis plays a very important part in such cases. Stricture formation may follow ulceration of the wall of the duct, the ulceration being due either to the calculus or to the incision made in the duct. Incisions within the mouth cavity must always, even in the best circumstances, become infected owing to the innumerable bacteria which are invariably present.

History of a Case.

A man, aged 45, had suffered from chronic enlargement of the right submaxillary gland for three years. He came nder observation in 1922, and a calculus was found at the pening of Wharton's duct and was easily removed. A year ter he returned to the hospital with a swollen submaxillary land, and a calculus was felt in the duct of the gland. he mucous membrane of the floor of the mouth was incised nder local anæsthesia and the calculus removed. An X ray hotograph was taken in order to see if there were any calculi the gland itself, but the result was negative. In 1926 e again presented himself at hospital with a very swollen bmaxillary gland in which a large calculus could be alpated with a finger inside the mouth and the thumb utside. Excision of the submaxillary gland was then ndertaken; three faceted calculi were found inside a very hickened and fibrosed gland, which was practically functionss as far as normal secretion was concerned.

One would expect that owing to their composition alivary calculi would be quite opaque to X rays. his proves to be usually the case, as Harrison, eporting upon 27 cases of salivary calculi in which peration was performed, obtained positive X ray indings in 81·4 per cent.

Calculus formation in the sublingual gland and its uct is a rarity, and very few cases are recorded. owever, calculi are sometimes found in association vith cystic distension of the gland. Burdel has eported a case of stone in the sublingual duct in an nfant three weeks of age.

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THE RÔLE OF HYDROCHLORIC ACID IN THE CAUSATION OF GASTRIC PAIN.*

By T. L. HARDY, M.D. Camb., M.R.C.P. Lond.,
ASSISTANT PHYSICIAN, GENERAL HOSPITAL, BIRMINGHAM.

It would seem almost a task of supererogation to revive discussion of an acid factor in the causation of gastric pain, in view of the apparently conclusive observations of Hurst[1] some 20 years ago, observations which have since received confirmation from many sources, clinical and experimental. Nevertheless it cannot be denied that there still exists in the minds of most laymen, and of not a few medical men, the belief that gastric pain must in some way be associated with gastric acidity, a belief which finds its expression in the occasional use of such terms as hyperchlorhydria and acid dyspepsia to denote clinical states illustrating cause and effect, and in the use of sodium bicarbonate or other alkali for their relief. But while the evidence, both clinical and experimental, is definitely opposed to such a view, recent work by Palmer[2] has renewed interest in the subject and certainly demands critical consideration. After confirming Hurst's observations that the mucous membrane of the stomach in healthy individuals was insensitive to concentrations of hydrochloric acid up to 0·5 per cent., he was able to reproduce in ulcer patients under suitable conditions of susceptibility their characteristic pain, not only with 0·5 per cent. hydrochloric acid, but also with concentrations which fell within physiological limits.

The reinjection of the gastric contents obtained at the time of the distress also reproduced it in some instances, and relief was invariably obtained either by emptying the stomach or by the use of alkalis. He found that the pain was produced most readily during the stage of active symptoms, and was usually absent during quiescent periods and after a course of treatment. Further, from a study of 15 cases he found no evidence of a positive response to acid in the absence of an organic lesion of the stomach or duodenum. He finally concluded that hydrochloric acid was not only an adequate stimulus to the pain-producing mechanism of a sensitive peptic ulcer, but was also the stimulus usually in evidence.

It was evident that if these results could be substantiated and the specificity of the test for ulcer established, the clinician would have an additional valuable method of distinguishing gastric pain due to peptic ulcer from that due to distant foci of irritation—for example, in the appendix, the colon, or the gall-bladder. In a later paper Palmer[3] claimed that his methods provided such a test, and the present investigation which follows very much the lines he adopted was undertaken in order to exploit this so-called acid test as an aid in differential diagnosis, and perhaps to throw additional light on the relationship of gastric acidity to gastric pain.

Technique of the Test.

After a night's fast the patient swallows a Ryle's tube and the stomach is emptied of its resting contents. 200 c.cm. of 0·5 per cent. HCl are then introduced into the stomach through the tube. The patient is kept in ignorance of the nature of the injected fluid and is informed that in all probability he will experience no unusual sensation, but that if he does he is to notify the observer. Suitable literature is provided to divert the mind, and at the end of half an hour, if no pain has been complained of, the stomach is emptied and a further 200 c.cm. of acid are introduced, and this is repeated a third time if necessary. The method is substantially that of Palmer, with the slight variation that the stomach is emptied at the end of each half hour period in order to avoid the accumulation of large quantities of fluid and to maintain the concentration of acid at a high level. The test is regarded as positive if the patient complains of unequivocal pain which he is able to recognise as identical with his previous symptoms, identical, that is, in kind, but not necessarily in degree. Severe pain can be promptly relieved by emptying the stomach or by the use of an alkaline powder.

Results of Investigation.

The total number of cases investigated, the great majority of whom attended my out-patient clinic in the first instance, is 228, and the number of examinations carried out 257. They are divisible into two groups—one consisting of 155 cases in whom organic disease of the stomach or duodenum was demonstrable, and the remainder, 73 in number, in whom no local lesion could be discovered. Reliance was placed on X ray diagnosis in 176 cases, severe hæmorrhage in 6, and surgical intervention in 46.

A comparison of the results obtained in the two groups makes it possible to assess the value of the acid test in differential diagnosis.

Table I.—*Organic Diseases of Stomach and Duodenum.*

Diagnosis.	Total cases.	Total tests.	Results of acid test.	
			Pos.	Neg.
Duodenal ulcer	87	105	41	64
Gastric ulcer	50	59	35	24
Gastro-jejunal ulcer	4	4	0	4
Gastric carcinoma	3	3	2	1
Hæmatemesis and melæna ..	6	6	1	5
Gastritis..	7	7	3	4
	157	184	82	102

Table I. shows the results obtained from 184 tests carried out on 157 patients suffering from organic disease of the stomach or duodenum. Eighty-two gave positive tests and 102 negative. Peptic ulcer accounts for the great majority of cases, and it will be noted that the proportion of positive results is considerably higher in ulcers of the lesser curvature than of the duodenum. In three cases of carcinoma two were positive, in one of which the pain was agonising, as was also the case in one of the three positive results in the cases of gastritis. It is interesting to note that the localisation of the pain, though usually referred somewhat vaguely to the epigastrium, may, when at all severe, be exceedingly accurate and even felt in the back. In one case, that of a duodenal ulcer, pain was, curiously enough, felt only in the left axilla; this localisation was reproduced with great accuracy as a result of a positive acid test.

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* An abstract of this paper was contributed to the discussion on various aspects of gastric chemistry at the Section of Medicine, Royal Society of Medicine, reported on p. 718.

TABLE II.—*Analysis of 103 Cases of Peptic Ulcer.*

Type.	Cases.	Tests.	Acid +.	Symptoms.		Acid —.	Symptoms.	
				Active.	Quiescent.		Active.	Quiescent.
Duodenal	70	88	37	36	1	51	12	39
Gastric	33	41	24	24	0	17	5	12
	103	129	61	60	1	68	17	51

Table II. shows the relationship of the results obtained to the period of the disease in which the test was carried out—whether one of active symptoms or of quiescence. Symptoms were considered to be active when spontaneous pain had been present within the preceding 24 hours. Of the 103 cases that are analysed it will be noted that all the positive results, with one exception, were obtained during a period of active symptoms, but more noteworthy is the occurrence of 17 negative tests during the active period. In one of these, a case of lesser curve ulcer, the symptoms were of recent duration, the pain of unusual intensity, and associated with slight rigidity and a localised area of superficial soreness, so that leakage was suspected.

TABLE III.—*Functional Dyspepsia and Extragastric Lesions.*

Diagnosis.	Total cases.	Total tests.	Results of acid test.	
			Pos.	Neg.
Functional dyspepsia	44	45	4	41
Constipation	12	12	2	10
Chronic appendicitis	7	8	4	4
Chronic cholecystitis	5	5	4	1
Cirrhosis of liver	1	1	—	1
Pancreatitis	1	1	—	1
Adhesions	1	1	—	1
	71	73	14	59

Table III. shows the results obtained in 71 cases where a lesion of the gastric mucosa could be excluded. Forty-four were cases of simple functional disturbance with negative X ray picture, and the remainder examples of gastralgia produced by irritative foci acting at a distance. The 12 cases of appendicitis and cholecystitis were confirmed by operation and the stomach and duodenum found normal in each instance. Nevertheless, four out of seven cases of appendicitis, and four out of five of cholecystitis gave positive acid tests, the pain in the latter being severe and in one case of appendicitis exceptionally so.

Thirty-four cases of ulcer were submitted to operation, and I have to thank my surgical colleague, Mr. H. H. Sampson, under whom the patients were admitted, for permission to make use of this material from which it is possible to obtain a clearer conception of the state of the ulcer in relation to the acid response. The acid test was found to be negative in 20 cases in whom little or no evidence of healing was observed at the operation.

As regards the results of treatment, 24 cases of ulcer with positive results were examined at the end of a course of medical treatment. In all but one the test was negative, and that was a case of a large active ulcer associated with an hour-glass constriction of the stomach. How soon the test becomes negative I am not prepared to say, but I have found it so a week from the commencement of treatment. One test was carried out a week after gastro-jejunostomy and was found to be negative, and a negative result was present a week after removal of the appendix; in both cases the test had previously been positive.

Discussion.

As a result of this investigation I have attempted to supply answers in part or in whole to two questions: (1) Is there an acid response sufficiently specific for ulcer cases to constitute a test of diagnostic value? (2) What part does hydrochloric acid play in the production of gastric pain?

The answer to the first question must clearly be in the negative, for pain typical in every way of ulcer, both as regards severity and localisation, was forthcoming, though not so commonly, in cases where a lesion of the gastric mucosa could undoubtedly be excluded (Table II.). General considerations would suggest that this must be so for the pains of ulcer can be simulated with absolute fidelity by a number of extra-gastric lesions, and must therefore almost certainly share with them a common mechanism. The discrepancy between the results described in this paper and those of Palmer can only be explained on the assumption that his cases were either examined during a period of quiescence or, more probably, were too few to bring out this point, for his series contains only one example each of chronic cholecystitis and subacute appendicitis, the lesions most likely to simulate ulcer in their symptomatology.

As regards the second question—the rôle of hydrochloric acid in the production of gastric pain—the matter is more difficult, and I am not prepared with a satisfactory answer. There seem to be three possible ways in which a chemical irritant might act: (1) by irritating the exposed nerve-endings in an area of ulceration; (2) by causing local spasm at the ulcer site and thus interfering with normal peristalsis; or (3) by causing a primary increase of tonus, as recently suggested by Poulton.[4]

The first two possibilities may be largely discounted, for in addition to being generally discredited on experimental grounds they fail to account for pain in the absence of structural defect. That there may be a local factor in certain instances is, however, suggested by some work of Ivy privately communicated to Alvarez,[5] which suggests that though not normally sensitive to painful stimuli, a mucous membrane, the seat of œdema or congestion, may become so.

The production of an increase in gastric tonus, and so pain, by hydrochloric acid lacks proof. All that can be said at the moment is that gastric pain typical in every way of ulcer has been produced by a number of experimenters, notably Poulton [4] and Hardt,[6] without calling in an acid factor; Hardt indeed in one case of gastric ulcer actually brought about relief by the introduction of 0·3 per cent. hydrochloric acid.

Palmer regarded hydrochloric acid as the adequate stimulus for ulcer pain normally present in the gastric juice; that it may be adequate in supernormal concentrations and at times in physiological ones he has abundantly proved, and his results have been confirmed in this paper, but when in his final summary [7] he states that acid is the normal stimulus for the pain mechanism I find it impossible to follow him, for my investigations so far as they go are definitely opposed to such a view. In the first place, the pain is rarely severe, and the patient, though able to identify it, will often volunteer the information that it is not nearly so severe as his typical distress, and this, be it noted, in the presence of acid values far in excess of those ever present in health or disease. The pain rarely shows itself when the acid concentration is at its maximum, that is, immediately after its introduction. Frequent analyses show that the acidity has usually undergone some reduction, at times considerable, before complaint is made. It is possible to explain this latent period on the grounds of a diminished threshold, but this is by no means always borne out by the patient's symptoms, and I have recounted one case of gastric ulcer of quite exceptional severity with a negative acid test.

With the weaker solutions, 0·25 per cent., I have frequently failed to get a satisfactory response when it was readily provoked by the stronger, and in the following experiment the reintroduction of gastric contents failed to reproduce pains of anything like the severity with which they were previously associated, and a subsequent injection of 0·5 per cent. HCl was practically without effect.

CASE R. B.—Big lesser curve ulcer; gastro-jejunostomy previously.

	Fasting juice, 15 c.cm.	Free HCl. 14 c.cm.*
9.45 :	200 c.cm. tap water.	
10.15 :	10 c.cm. only left	5 ,,
	200 c.cm. 0·5 per cent. HCl.	112 ,,
10.20 :	Pain severe.	
10.30 :	Stomach emptied 250 c.cm. Pain went at once.	64 ,,
10.50 :	Contents 250 c.cm. reintroduced.	
11.10 :	Pain very slight indeed.	
11.20 :	Pain gone.	
11.50 :	Stomach emptied 35 c.cm.	−12 ,,
11.50 :	100 c.cm. 0·5 per cent. HCl.	112 ,,
12.5 :	Pain slight.	
12.15 :	Stomach emptied 105 c.cm.	65 ,,
12.20 :	Pain much easier.	

* 1/10 N. soda per cent.

It might have been expected if hydrochloric acid were the normal stimulus for pain production that some relationship would be found between the type of pain the patient complained of, whether early or delayed after meals, and the latent period following the acid test, but no such relationship could be established, the proportion of positive results occurring during the first and second periods being roughly the same in the 47 cases in which this point was specifically noted. (Table IV.)

TABLE IV.

Type of pain.	No. of positives.	Period of test.		
		First.	Second.	Third.
Early	20	12	7	1
Delayed	27	17	9	1
	47	29	16	2

The use of histamine naturally suggests itself as a means of adding confirmation to the acid theory, but I have so far failed to produce any sensation whatsoever in ten ulcer patients, previously acid positive and still in an active phase, by the injection of one milligramme of histamine acid phosphate, though the subsequent acid values were well above normal; and in a recent experiment a failure with histamine was immediately followed by a positive result with 0·25 per cent. of HCl, though the acid values were at a considerably lower level.

CASE W. B.—Duodenal ulcer.

	Fasting juice 25 c.cm.	Free HCl. 10 c.cm.*
Zero :	1 mg. histamine acid phosphate	
10 mins. :	Stomach emptied 26 c.cm.	32 ,,
17 ,,	,, ,, 35 ,,	70 ,,
32 ,,	,, ,, 62 ,,	95 ,,
44 ,,	,, ,, 21 ,,	89 ,,
48 ,,	,, ,, 15 ,,	83 ,,
	200 c.cm. 0·25 per cent. HCl.	
50 mins. :	Pain began.	
60 ,,	Pain fairly severe. Specimen	74 ,,
65 ,,	Pain easier.	46 ,,
70 ,,	Pain almost gone.	
72 ,,	,, ,, ,,	
80 ,,	Stomach emptied 100 c.cm.	37 ,,
85 ,,	Pain still just appreciable.	
95 ,,	200 c.cm. 0·5 per cent. HCl. Pain at once.	
100 mins. :	Pain worse	137 ,,
110 ,,	Pain still severe. Specimen	51 ,,
	One drachm magnesium phosphate.	
115 mins. :	Pain easier	32 ,,
117 ,,	Pain gone	67 ,,

* 1/10 N. soda per cent.

It may be that the volume of the injected fluid plays a part, but I have no evidence to show that this is so, and I recall two cases in which the pain increased in severity after the stomach had been emptied.

Clinical observation from many aspects tends to support these findings and to suggest that the pains of peptic ulcer are independent of acid concentrations, for it is well recognised that severe and typical distress may be associated, though not commonly, with achlorhydria. The rapid relief of pain which follows the institution of an ulcer régime, whether associated with intensive alkalinisation as in Sippy's methods or following those of Lenhartz and Smithies in which alkalis play no essential part, is rarely accompanied by any lowering of acid values, and the present author [8] concluded that clinical improvement was independent of chemical change in a considerable number of cases, while in a few it was actually associated with a rise in acidity. Crohn and Reiss,[9] as a result of an intensive study of 34 ulcer cases treated by Sippy's methods, found a rough parallelism only between clinical and chemical improvement.

The view that alkalis relieve gastric pain by a process of neutralisation must also be subject to criticism, for it is noteworthy that such a result may be equally prompt in cases where the acid values are low, and indeed in some cases of carcinoma where free acidity is absent. Fractional studies, too, show that such neutralisation is of very brief duration, and is usually followed by a rise in acidity in excess of that previously recorded; yet the clinical relief outlasts the period of neutralisation and is unaffected by the subsequent hyperacidity. The explanation of the beneficial action of alkalis is probably that advanced by Spencer, Meyer, Rehfuss, and Hawke,[10] who found that these substances brought about a more rapid emptying of the stomach.

Such evidence, then, as I have been able to bring forward in this paper is opposed to any view which assigns to hydrochloric acid anything but a very minor rôle in the mechanism of gastric pain. The vagaries of gastric pain are well known. It comes and goes in a manner which suggests little dependence on chemical factors. The internal influences, infection, fatigue, tobacco, and the external ones, worry, rest, change, speak for a nervous rather than an acid control, and while it cannot be denied that the gastric acidity may occasionally be effective it must be emphasised that no theory of gastric pain can be regarded as satisfactory unless it will explain all the facts.

Conclusions.

1. Hydrochloric acid in concentrations of 0·5 per cent. will reproduce typical gastric pain in certain susceptible individuals suffering from painful disturbances of gastric function.
2. The pain occurs independently of any local disease in the stomach or duodenum.
3. The rôle of hydrochloric acid is discussed and the view put forward that it plays no essential part in ordinary pain production.

I gratefully acknowledge the valuable help I have received from Miss Fisher and Miss Graham, nursing sisters, in carrying out the tests, and from Mr. Garfield Thomas, biochemist to the hospital, who undertook numerous chemical analyses.

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A CONTROL OBSERVATION WITH SANOCRYSIN.

BY B. R. CLARKE, M.D. BELF.,
MEDICAL SUPERINTENDENT, FORSTER GREEN HOSPITAL, BELFAST;
AND
H. G. K. HADDICK, M.B., B.CH. BELF.,
FORMERLY HOUSE PHYSICIAN AT THE HOSPITAL.

SINCE May, 1925, certain patients suffering from pulmonary tuberculosis have been treated with sanocrysin at the Forster Green Hospital. Marked improvement followed the treatment in some instances, and encouraging reports from other observers have been published. It was, however, decided to carry out a control observation during 1927. The difficulty of assessing the value of any treatment of pulmonary tuberculosis is notorious, and it is the opinion of the writers that no treatment has gained anything like general acceptance, except the régime known as sanatorium treatment and in selected cases collapse therapy. Thus, after many years' trial, some competent physicians have abandoned tuberculin therapy, while others continue to advocate it. Alpine treatment, once regarded as the *ne plus ultra* of the therapy of tuberculosis, also has its critics. Sanocrysin treatment is certainly not free from danger, and it is expensive and troublesome—three special reasons why it is imperative to assess its value, if it is to be considered at all. Several observers, some of whom are undoubted authorities on the treatment of tuberculosis, have recorded no good results from sanocrysin treatment.

These were some of the considerations which suggested an observation of the results of sanocrysin treatment with a control group of similar cases. Moreover, it was not practicable to treat more than a limited number of patients, and therefore it seemed justifiable to select the cases in such a way that a control observation could be made. Sanocrysin treatment would not have been withheld from any patient in the control group—if he had asked specially for it and had been considered a suitable case.

Dr. F. R. Walters[1] emphasises certain conditions which must be fulfilled before a treatment of pulmonary tuberculosis can be tested. So far as possible these conditions have been fulfilled in carrying out the observation. The conditions were as follows:—

(1) All patients admitted during 1927 who had tubercle bacilli in the sputum were divided into two groups alphabetically. Those whose names began with the letters A to K did not receive sanocrysin treatment; those whose names began with the letters L to Z received sanocrysin treatment, if they appeared suitable and were willing to have it. (2) Patients readmitted to the hospital or who remained for less than six weeks were excluded from the observation. Of course this method does not ensure that the two groups would be strictly comparable, but it excludes any conscious or unconscious selection of the more favourable cases for the special treatment. It appeared, from a common sense point of view, that if the control group did as well as the sanocrysin-treated group, it might reasonably be inferred that sanocrysin was without much value. On the other hand, if the results in the sanocrysin-treated group were much better, there would be, at least, a case worth further examination. At the same time, an attempt was made to compare the two groups in every respect which might have a bearing on prognosis.

The following factors were considered: (1) Sex; (2) family history; (3) duration of disease from first symptoms; (4) temperature on admission to hospital; (5) pulse-rate on admission to hospital; (6) presence of cavity clinically; (7) presence of cavity radiologically; (8) extent of involvement of the lungs radiologically; (9) classification, devised by the Society of Superintendents of Tuberculosis Institutes; (10) complications.

Altogether[2] 112 patients having tubercle bacilli in the sputum were admitted to hospital during 1927; 2 of these were readmissions and 13 remained less than six weeks in hospital (one readmission in A to K group, one readmission in L to Z group; five remained less than six weeks in A to K group; eight remained less than six weeks in L to Z group). The 97 patients to be considered were divided as follows:—40 patients whose names began with the letters A to K; 57, L to Z.

The following tables compare the condition of the two groups on admission to hospital. Throughout this paper normal temperature is regarded as 98·6° F.;* subfebrile temperature is regarded as 98·6° to 99·6° F.;* febrile temperature is regarded as higher than 99·6° F.*

Normal pulse-rate is regarded as: Not more than 80 (*a*) and 84 (*b*).

Moderate pulse-rate: 80–96 (*a*) and 84–100 (*b*).

Rapid pulse-rate: More than 96 (*a*) and more than 100 (*b*).

(*a*) Evening pulse-rate for men, and (*b*) for women.

Comparison of Sanocrysin Group L to Z with Control Group A to K.

1. Sex.

	A to K.	L to Z.
Male ..	19	27
Female ..	21	30

2. Family history of tuberculosis.

	A to K.	L to Z.
Positive ..	21	29
Negative ..	19	28

3. Duration from first symptoms

Months—	A to K.	L to Z.
Less than 3	6	11
3 to 6 ..	10	15
More than 6	24	31

4. Temperature on admission.

	A to K.	L to Z.
Normal ..	17	17
Subfebrile	16	25
Febrile ..	7	15

5. Pulse-rate on admission.

	A to K.	L to Z.
Normal ..	7	6
Moderate ..	21	33
Rapid ..	12	18

6. Presence of cavity, clinically.

	A to K.	L to Z.
Present ..	12	20
Absent ..	28	37

7. Radiological shadows suggesting cavity.

	A to K.	L to Z.
Present ..	23	41
Absent ..	17	16

8. Extent of lung involvement, radiologically.

	A to K.		L to Z.	
1. Zone ..	0	25	3	30
2. Zones ..	14		9	
3. ,, ..	11		18	
4. ,, ..	9	15	14	27
5. ,, ..	5		8	
6. ,, ..	1		5	

9. Classification on admission.

	A to K.	L to Z.
Incipient ..	2	7
Moderate ..	23	25
Advanced	15	25

10. Complications.

—	A to K.	L to Z.	Total.
Tuberculous laryngitis	4	8	12
Fistula-in-ano	1	3	4
Cervical adenitis	1	2	3
Tuberculous osteitis of femur ..	—	1	1
Spontaneous pneumothorax ..	—	1	1
Tuberculous meningitis	1	—	1
Thrombosis of femoral vein ..	1	—	1
Tonsillitis	—	4	4
Hæmorrhoids	—	1	1
Goitre	—	2	2
Duodenal ulcer	—	1	1
Epilepsy	—	1	1
Nephritis	2	—	2
Total	10	24	34

The comparison of the two groups shows that the sanocrysin-treated group appears to have a more unfavourable prognosis than the control group with reference to the temperature on admission, pulse-rate on admission, presence of cavity, clinically and radiologically, and extent of lung involvement radiologically. On the other hand, the control group contained a higher proportion of patients whose first symptoms appeared more than six months before admission.

Sanocrysin treatment was attempted or completed in 39 patients of the L to Z group. Artificial pneumothorax was tried in 12 patients of the L to Z group and 14 patients of the A to K group.†

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* Evening mouth temperature.

† The high proportion of artificial pneumothorax cases is largely due to the fact that patients are often selected for admission by the tuberculosis officers because of their suitability for this treatment.

In considering the results of treatment two patients in the A to K group and two patients in the L to Z group, who are still in hospital, have been regarded as discharged on Oct. 17th, 1928, their condition on that date being regarded as their condition on discharge.

Results.

1. *Immediate Result of Treatment, as shown by Condition on Discharge.*

Group.	Quiescent.	Improved.	Unchanged.	Worse.	Total.
A to K (control group)	4	28	5	3	40
L to Z (sanocrysin group)	20	26	7	4	57

Of the patients in the control group A to K five had an artificial pneumothorax with satisfactory collapse (quiescent, 2; improved, 3). In the sanocrysin-treated group L to Z four patients had artificial pneumothorax treatment with satisfactory collapse (quiescent, 2; improved, 2). Excluding these nine cases the results are shown below.

2. *Immediate Result (excluding Nine Cases which had a Satisfactory Artificial Pneumothorax).*

Group.	Quiescent.	Improved.	Unchanged.	Worse.	Total.
A to K (control group)	2	25	5	3	35
L to Z (sanocrysin group)	18	21	7	4	53

3. *Sputum on Discharge from Hospital.*

Group.	No tubercle bacilli or no sputum.	Bacilli present, but less than 1/10 number of bacilli on admission.	No improvement.
A to K ..	6	7	27
L to Z ..	24	8	25

4. *Result of Treatment with Reference to the Duration of Stay in Hospital.*

Time in hospital in months.	Group.	Quiescent.	Improved.	Unchanged.	Worse.
Less than 3 ..	A–K	—	4	1	1
	L–Z	2	8	3	0
3 to 6	A–K	1	13	1	1
	L–Z	5	3	0	2
6 to 9	A–K	3	5	2	1
	L–Z	7	5	2	1
9 to 12	A–K	0	4	0	0
	L–Z	2	8	0	0
More than 12 ..	A–K	0	2	0	0
	L–Z	4	2	2	1

5. *Number of Patients known to be Dead on Dec. 31st, 1928.*‡

Group.	Number.	Dead.
A–K	40	11
L–Z	57	7

Note on the L to Z Group from which the Sanocrysin Cases were Selected.

There were 57 patients in this group and 39 of these had sanocrysin treatment. In eight cases the treatment was considered unnecessary; in seven it was contra-indicated, and three refused it.

Of the 39 patients treated with sanocrysin the treatment was completed in 30 and given up in 9. The reasons for abandoning treatment in these 9 cases were as follows:—

Failure to improve ..	3	Progressive loss of weight ..	1
Diarrhœa	2	Focal and general reaction	1
Albuminuria	1	Acute tonsillitis	1

The results of treatment in these 9 cases were as follows:—

Quiescent	0	Unchanged	4
Improved	2	Worse	3

Considering the 30 cases whose treatment was completed, the results were as follows:—

Quiescent	15	Unchanged	1
Improved	13	Worse	1

Of the 30 patients whose treatment was completed 26 gained and 4 lost weight during the course of the injections. Of the 9 patients whose treatment was not completed 2 gained and 6 lost weight. One patient was not weighed.

It is not the purpose of this article to discuss the details and technique of sanocrysin treatment. The method used in all cases was the system of graduated dosage which is now widely employed. Graduated dosage has been the invariable rule at the Forster Green Hospital since August, 1925, and the loss of weight, which was so common a feature of the first cases, is now exceptional. Thus of the 39 cases treated in 1927 28 gained and 10 lost weight during the injections. The average gain of weight during the treatment was 7 lb., the greatest gain being 31 lb. in 14 weeks. The average loss of weight was 2½ lb., the greatest loss being 5¼ lb.

The complications which occurred during the sanocrysin injections were as follows:—

Febrile reactions following an injection	13	*Diarrhœa*	2
Subfebrile reactions following an injection ..	12	Stomatitis	1
Well-marked albuminuria	9	Dermatitis	1
Transient albuminuria ..	8	Neuritis	1
Vomiting	3	Focal and general reaction	1
		Œdema of the eyelids ..	1

Two other clinical observations of cases, treated with sanocrysin and compared with similar "control" groups, have been published by Würtzen[3] and Bie and Andersen.[4] Both these observations point to the conclusion that the sanocrysin-treated cases do better than untreated cases, and the results obtained at the Forster Green Hospital appear to justify a similar conclusion.

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4. Bie and Andersen: Acta Tub. Scand., 1927, iii., 61.

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‡ All patients included in the observation will be traced in January, 1929.

LEEDS GENERAL INFIRMARY.—About 14,500 in-patients were admitted last year, 1000 more than in 1927, and surgical cases alone amounted to 5000. Notwithstanding that the average stay of each in-patient is only 11 days, the waiting-list contains more than 1000 names. The out-patients exceeded 50,000, an increase of about 3000. Patients suffering from motoring accidents grew to 1135. Their treatment cost £1775, of which only £167 was repaid. The deficit on ordinary expenditure was £23,500 and the accumulated deficit of the last eight years is £76,550. The income from annual subscribers last year was only £7100.

DONATIONS AND BEQUESTS.—Mr. John Allison Barr, of Pollokshields, Glasgow, left among other bequests, £2000 to Glasgow Royal Infirmary; £1000 each to the Western Infirmary, Glasgow, the Victoria Infirmary, the St. Andrews Ambulance Association, the Glasgow Ear, Nose, and Throat Hospital, the Royal Hospital for Sick Children, the Glasgow Eye Infirmary, and the Royal Glasgow Asylum for the Blind; and £200 to the Royal Samaritan Hospital for Women, Glasgow.—Mr. James Haggart Dewar, of Whittinghame Drive, Kelvinside, Glasgow, left £2000 to the Royal Hospital for Sick Children, Glasgow, and £1000 to the Princess Louise Hospital for Limbless Sailors and Soldiers, Erskine.

Clinical and Laboratory Notes.

AN OBSCURE CASE OF ULCERATIVE ENDOCARDITIS OF THE TRICUSPID VALVE.

BY J. F. WILKINSON, M.B., M.SC., PH.D. MANCH.,
HOUSE PHYSICIAN, MANCHESTER ROYAL INFIRMARY.

THE difficulty in establishing a diagnosis of malignant endocarditis of the tricuspid valve, recorded by Scott Pinchin and H. V. Morlock in THE LANCET of Feb. 2nd (p. 230) is of considerable interest in view of a similar case recently at the Manchester Royal Infirmary under the care of Dr. F. Craven Moore, who allows me to place the following particulars on record.

A policeman, aged 47, was admitted to the Manchester Royal Infirmary on Dec. 24th, 1928, complaining of extreme dyspnœa and excessive perspiration, together with a cough and abundant expectoration. He had had bronchitis for the last 28 years, with more severe exacerbations during the winter months. Five years before he had had an attack of dyspnœa and profuse perspiration, not so acute as the last attack, which had improved after rest in bed. Two years before (1926) he had been confined to bed for two weeks with "rheumatic" pains in both feet, more particularly in the toes, no other joints being affected. Although he had noticed occasional slight œdema of the ankles during 1927, he was well from that time until the last week in November, 1928—the commencement of the present attack. He complained of a slight pain over the right hypochondrium and xiphisternum, which he thought was due to flatulence, and this was followed by two "shivering attacks" in one day. He was better next day and did not come under medical supervision at this stage. Finding himself getting very short of breath and perspiring more profusely than usual, he stayed in bed from Dec. 15th until Dec. 17th, when he returned to duty, but was not able to [illegible]. From that date, until his admission into the Manchester Royal Infirmary a week later, he was confined to bed with an increasing degree of dyspnœa, perspiration, cough, and expectoration. No typical asthmatic attack was described, nor was there any history of rash, purpuric spots, hæmatemesis, hæmoptysis, or hæmaturia. Urine and bowels had been normal, and the patient had abstained from tobacco and alcohol for the last five years and one year respectively.

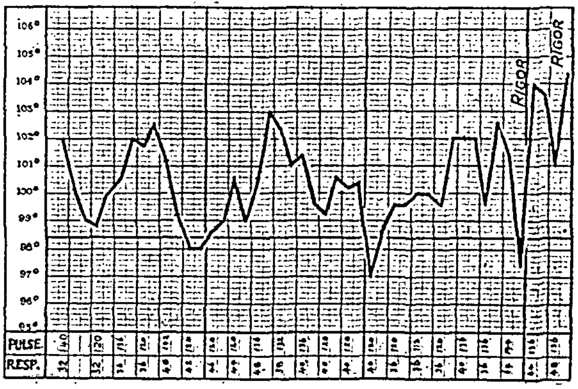
Previous Medical History.—He had been a policeman since his discharge from the army after the Boer war. While in South Africa he had contracted typhoid fever, malaria, and double pneumonia (twice), but had had no other illnesses.

Condition on Examination.—He was a very heavily built man, weighing 20 st. He was very cyanosed and extremely dyspnœic and there was a profuse perspiration, especially over the upper half of the body. His teeth showed evidence of pyorrhœa, but the tonsils were not enlarged and there were no enlarged glands. There were no signs of œdema of the legs, ascites, purpuric or tender spots, rash, or retinal hæmorrhage. His respiration-rate was 32, his temperature 102° F., and his pulse was 140 and regular. The apex-beat was not determined and cardiac dullness was obscured by the emphysema and the thickness of the chest wall. Clear auscultation was difficult owing to the respiratory adventitious sounds and the extreme dyspnœa, which prevented the patient from holding his breath, but there appeared to be a somewhat indefinite, soft systolic murmur between the xiphisternum and the apex. There was no venous pulsation in the neck, and the liver and spleen were not palpable. The lungs were emphysematous. There were generalised rhonchi, moist sounds at both bases, and a slight friction rub at the left base posteriorly. Nothing abnormal was detected in the very large abdomen. Urine and fæces were normal.

Course of Illness.—The patient was sent to the Manchester Royal Infirmary as a case of acute bronchitis with asthma, and the progress was as follows. There was extreme dyspnœa and, although restless, he was only able to turn in bed with assistance. A typical asthmatic attack occurred the first night after admission. Perspiration was very free throughout the course of the illness and did not respond to treatment. The temperature was very irregular (see chart), but the first rigors (three in number) only occurred on Jan. 13th, 1929, three weeks after admission, and were repeated two days later. He complained of slight pain in the left side of the chest posteriorly; there was no abdominal pain. There was much frothy mucous sputum (no tubercle bacilli were found), but no hæmoptysis or staining until Jan. 14th. Cough was variable but not excessive. Two separate and independent attacks of melæna occurred in the second and third weeks respectively after admission. Daily examination of the cardiac condition did not disclose any demonstrable alterations. The urine never contained albumin. During the last week of the illness the left arm and hand became swollen and very tender, as later did the right. This was due to fixation abscesses, from which a practically pure culture of pneumococci was isolated.

On Jan. 14th the *blood count* was as follows: red cells, 3,288,000; white cells, 11,600; hæmoglobin, 60 per cent.; *colour-index*, 0·94; *polymorphonuclears*, 72·75 per cent.; lymphocytes, 22·75 per cent.; large mononuclears, 4·25 per cent.; eosinophils, 0; basophils, 0·25 per cent. Slight anisocytosis and poikilocytosis was present. No abnormal cells were seen. Platelets were abundant.

On Jan. 15th, 1929, there was evidence of consolidation at the base of the left lung behind the mid-axillary line, the illness terminating next day. The patient was unimpaired mentally, and the physical condition did not alter appreciably from the date of admission until the last 36 hours. No radiographic examination could be made owing to the condition and size of the patient.



Post-mortem Findings.—The pericardium was normal. The heart weighed 440 g. The myocardium was of good colour and slightly soft. The right auricle only was moderately dilated, and there were no thrombi. The right ventricle showed slight dilatation but no hypertrophy; the left showed slight dilatation and hypertrophy. The tricuspid valve admitted three fingers; the valve substance showed no old lesion but there was a mass of crumbling vegetations, the size of a hazel-nut, based broadly on the middle of the anterior cusp, and a small mass, the size of a pea, on the septal cusp. The vegetation presented to the ventricular side, which also showed ulceration. The mitral valve admitted two fingers and showed no stenosis; the chordæ tendinæ to the anterior cusp were definitely thickened but not contracted. The anterior cusp showed slight roughening and minute vegetations at its middle portion. The aortic and pulmonary valves were normal. There was moderate atheroma of the aorta and coronary arteries.

Both pleuræ were normal. The right lung weighed 640 g. and showed a moderate degree of vesicular emphysema, well aerated throughout, but no œdema nor consolidation. The left lung weighed 760 g. and showed vesicular emphysema; the lower lobe was somewhat congested and the seat of slight consolidation, chiefly posteriorly; the upper lobe was well aerated throughout. There was moderate congestion of the larger bronchi. There was a group of seven ulcers round the lesser curvature of the stomach near the cardia; the largest, on the posterior wall of the fundus, was 3 by 2 cm., the smallest 1 by 0·5 cm.; they penetrated the mucosa but based on the submucosa, and were evidently of recent origin. The spleen weighed 460 g. and was of moderate consistence, dull red and septic. The liver weighed 2360 g.; a fairly well-marked fatty infiltration accentuated the lobules. The biliary passages were normal. The thyroid gland weighed 90 g. and was fairly large and full of colloid. The kidneys weighed 260 g. each; the capsules stripped normally and the surfaces were smooth, but the cortices were paler than normal; there were no infarcts or abscesses. On the outer aspects of both upper arms there were fixation abscesses at the sites of therapeutic injection.

Several points of interest arise in the consideration of this case. The excessive perspiration and extreme dyspnœa were notable features and, coupled with the temperature, pulse, and respiration rates and the friction rub at the left base, suggested the possibility of an early pneumonia. The progress of the case did not fully justify this diagnosis and, in view of the history of recent onset of asthma in a man of 47 years of age, the possibility of a thoracic neoplasm was also considered but did not correspond with the clinical condition. The absence of definite cardiac signs, embolic phenomena, or positive blood-culture (cf. Scott Pinchin and Morlock, loc. cit.) or rigors was very striking, the irregular pyrexia being the only sign indicative of a possible cardiac lesion. The sudden melæna occurring in the second and third weeks raised the question of typhoid fever, but appropriate investigation did not support this. The thrombotic gastric ulcers were the only definite secondary results discovered that might be ascribed to the cardiac lesion, and it is interesting to note that no gastric symptoms were described.

Acknowledgment is made to Prof. J. Shaw Dunn for permission to use the records of his post-mortem investigation of this case.

A NOTE ON
LEPROUS LESIONS OF THE SCALP.

By A. R. DAVISON, M.R.C.S. ENG.,
MEDICAL OFFICER, EMJANAYANA LEPER INSTITUTION, SOUTH AFRICA.

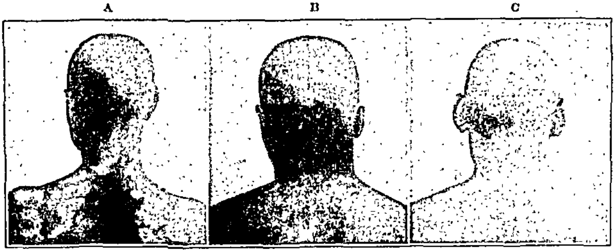
IN 1927 two native patients of the Emjanyana Leper Institution were discovered to have leprous lesions of the scalp. This is considered to be a very unusual situation. Thus Rogers and Muir ("Leprosy," 1925, p. 143) state:—

"Leprosy bacilli have been found in the corium of the skin over almost the whole body. A noticeable exception to this is the scalp, where, as far as we are aware, leprous lesions are seldom or never found."

They also say (p. 168):

"It is remarkable that there were no lesions of the scalp recorded. We have never yet come across any leprous lesions of the scalp, either as a primary or as a subsequent lesion, though we have met with anæsthesia of the scalp due to leprous disease of the supra-orbital nerve."

FIG. 1.



CASE 1.—Maculæ extending to scalp. CASE 2.—Maculæ behind ears and over occiput. CASE 3.—Nodular leprosy of scalp.

Frequency of Scalp Lesions.

Over a period of nine months all new admissions to this institution have been shaved as a routine, and an examination of their scalps has revealed the following figures:—

Total No. of cases.	Nodular infiltration of scalp.	Maculæ in scalp.	No leprous lesions in scalp.
Males, 72.. ..	7	24	41
Females, 53 ..	2	18	33

The percentage of scalp lesions in males is 43 and in females 38. The lesions of the scalp are similar to leprous lesions in other parts of the body, in that they show *depigmentation, anæsthesia, and erythematous* and raised margins. Lepra bacilli are present in clip smears from these areas. Maculæ are difficult to discern in an unshaved scalp, but nodular infiltration causes a falling of the hair over the affected area and so may be more easily noticed. Examples of our findings are:—

CASE 1, female, is in the reactionary phase of the maculo-anæsthetic type, with multiple coalescing maculæ of the scalp. The maculæ have raised erythematous, scaling margins. The centres are anæsthetic. There is an infiltrated plaque over the occipital protuberance. Clip smear three inches above right ear showed lepra bacilli. (Fig. 1A.)

CASE 2, male, has maculo-anæsthetic type. Six well-defined maculæ involve the lower border of the scalp. Two *are situated below the occiput, one is behind the right ear* and three behind the left ear. The maculæ are anæsthetic and have raised margins. Lepra bacilli are present over the occiput. (Fig. 1B.)

CASE 3, male, has nodular type infection. There is partial baldness, which extends in parallel lines from the brow to the back of the neck. The skin of the bald areas shows interfollicular infiltration, except over the occiput, where the skin has become papery. Clip smears taken two inches above the occiput and four inches above the right ear show lepra bacilli. (Fig. 1C.)

It is strange that our South African natives should be liable to leprous lesions of the scalp, whereas the natives of India are exempt—though the lesions we found were not suspected and were almost invisible until the scalp was shaved.

Predisposing Factors.

Factors which may predispose our natives to these lesions are:

1. The negroid type of hair, which is short, frizzled, and scanty compared to that of a European or an Indian. The blood-supply, therefore, is probably less in proportion. The scalp, being less protected by the hair, is more liable to come into direct contact with leprosy-infected articles.

2. *The state of personal cleanliness and hygiene is* very poor amongst the natives. Pediculosis is common, and it is not unusual to see natives searching one another's scalps with as much gusto as monkeys. Scratching and consequent abrasion of the scalp is therefore not uncommon.

3. Amongst other causes of scalp injuries we may mention the native stick fights, the habit of carrying articles on the head, and the fact that a stone or a block of wood is the usual head-rest at night.

It is obvious, therefore, that the scalp of the South African native is constantly exposed to the entrance of germs, and that the low state of hygiene predisposes to the development of bacilli which have once gained entrance.

The method which we have used for demonstrating the lepra bacilli is simple and efficacious. A fine *needle is passed through the skin at the edge of the* macula and the transfixed skin is clipped through below the needle. The needle serves the double purpose of rendering the part bloodless and enabling the clipping to be easily transferred to the slide, over which it is firmly smeared. The slide is stained in the usual way.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

GASTRIC CHEMISTRY.

AT a meeting of the Section of Medicine, held on March 26th, Dr. ARTHUR F. HURST, the President, being in the chair, a discussion on gastric chemistry was opened by Prof. LEONARD PARSONS (Birmingham), who read a paper on the significance of

Achlorhydria in Infancy and Childhood.

The subject was, he said, of peculiar importance because of the two opposing views which had been advanced. Faber held that the achylia gastrica of adults was the result of a deep-seated hæmatogenous gastritis, which itself was the result of acute infective disorders in childhood and infancy. Brocq found that achlorhydria occurred in the infectious disorders of childhood, and that it might persist for years after the original disease had been recovered from. Brocq had also investigated the stomach of children who had suffered from infectious disorders and found achlorhydria, with evidence of chronic gastritis. That authority never found achylia in healthy children. Pyelitis might show itself first by diarrhœa and vomiting, and that was associated with achylia. It had been suggested that this diarrhœa was due to extension of organisms from the colon and the small intestine. The suggestion had been advanced that there existed a constitutional achylia gastrica; and Dr. Hurst had stated that there was a constitutional, often a familial, achylia gastrica which was not associated with any known structural change in the mucous membrane of the stomach. The speaker had found cases of achylia which seemed to permit of no other explanation. At the Birmingham Children's Hospital, however, an attempt had been made to attack the problem anew by means of test-meals. The result was that he believed he was now able to show that Dr. Hurst's ideas were not correct. Dr. Parsons submitted five propositions: (1) Achlorhydria might be due to a rapid emptying of the stomach, though sometimes the emptying was found to be slow. (2) It might be due to the type of test-meal used. Or (3) to the presence of enteral infections. (4) In all cases showing supposed achlorhydria there was evidence of secretion of hydrochloric acid, so that it was a false achylia. (5) There was no evidence of innate hyperchlorhydria.

He had investigated 51 cases, and ten of them showed no free hydrochloric acid in the test-meal. The latter was the meal which the child had been having; he had not been using a standard meal. Foods differed in their buffer value. If there was no free hydrochloric acid present, the buffer capacity was the total acid plus the free acid present. Cow's milk had a higher buffer capacity than had human breast milk. If a child was ill, its difficulty in producing that quantity of free hydrochloric acid might lead to achlorhydria. He had been using acid milks—i.e., containing lactic acid and hydrochloric acid. The total acidity curve was made up of protein, HCl, organic acids, and acid salts. Mineral chlorides were found to make no difference to the acid curve. The amount of lactic acid produced in the infant's stomach was insignificant, and therefore the rise of the acidity-deficit curve must be due to the secretion of hydrochloric acid, and that occurred in all cases of achlorhydria.

In artificially fed children the hydrochloric acid was nearly always low. He had arrived at the conclusion that there was no such condition as innate achylia gastrica. He was not clear whether the latter in adults was to be considered the same as the achlorhydria of childhood. Some cases of pernicious anæmia showed no rise in the acid-deficit curve; but in the adult it might be a further stage of the false achylia in childhood.

Dr. W. S. C. COPEMAN (London) read a paper, by himself and Dr. N. GRAY HILL, on

Fractional Test-meals in Childhood.

The submission was made by a series of charts shown on the screen, and was based on the investigation of seven cases in which there was no free hydrochloric acid in 66 children examined, and who were without gastric disorders or history of such. The seven children were of normal height and weight for their age, and their ages ranged from 12 to 15 years. All the children were on a normal mixed diet, and appeared to have no craving for any particular kind of food. The general result was that the total acidity was parallel with the free hydrochloric acid.

Dr. S. W. PATTERSON (Ruthin) followed with a paper on the

Pathology of Gastric Secretion,

setting out the results of an analysis of 662 cases in which a Rehfuss test-meal was given, and estimations were made of total chlorides, total acidity, and free hydrochloric acid in samples taken at 15-minute intervals. He divided the cases into groups: (1) those showing various types of gastric lesion; (2) those showing various extragastric lesions which might presumably cause reflex disturbance, such as inflammation of the appendix or gall-bladder, gall-stones, colitis, abscesses of teeth, &c.; (3) normal. Considerable variation occurred in the normal group, as Bennett and Ryle had already noted. Achlorhydria was present in some. There was a tendency for duodenal ulcer cases to give a superacidity curve, this sometimes rising by steps until the time the stomach was emptied. In gastric ulcer the curves were normal except when the ulcer was in the pyloric region. Cases of gastritis and carcinoma of the body of the stomach showed subacidity. As to conditions affecting the rest of the alimentary tract, appendicitis cases gave curves within normal limits, but there was a tendency to superacidity in cases of cholecystitis, also in some patients with colitis and diverticulosis of the colon. The acidity curve was lowered by such infections as tubercle, and by septic conditions (tooth abscesses, &c.). When the total acidity was correlated with the state of the pylorus and duodenal cap as revealed by the X ray screen, a grouping took place into those of pyloric or duodenal ulcer with superacidity, pyloric rigidity (as in carcinoma with achlorhydria, pyloric compression, or irritability or spasm) which tended to show some superacidity, and normal.

The Rehfuss test-meal, he said, gave little stimulus to appetite, therefore the results were largely of the chemical or second phase of gastric secretion. An interpretation of the results as variations in response of the secreting fundus glands and the hormone-producing glands of the pylorus offered an explanation of the pathology of gastric secretion. Gastric secretion was altered in cases in which the secreting part of the stomach was replaced, as in carcinoma of the body of the stomach; or when it was absent or atrophic, as in pernicious anæmia; or when it was rendered abnormal by inflammation, as in gastritis; or when it was reduced in efficiency by the presence of tubercle or sepsis in some other part of the body. Dr. Patterson believed that in other cases the receptivity of the mucous membrane of the pylorus to chemical stimulation and in its motor functions lay the key to the pathology of gastric secretion.

Dr. J. F. VENABLES (New Lodge Clinic) read a communication by Dr. T. W. TURNER and himself on the true

Frequency of Hyperchlorhydria in Duodenal Ulcer.

He was, he said, using the classification which Bell arrived at in 1923 as a result of the analysis of 425 test-meals, giving six varieties. It was generally accepted that in duodenal ulcer the hyperchlorhydria provided the largest percentage of test-meals met with. Cases had often been met with in which the diagnosis was established by X ray findings, a history of occult blood in the stools, &c., and in which the test-meal had belonged to the normal, or even the hyperchlorhydria group. There was no constant test-meal in gastric ulcer. He spoke of an investigation of 40 cases, of which 27 were duodenal ulcer and 13 gastric ulcer. They were given test-meals during the initial investigation, and each case was treated medically, with rest, diet, alkalis, removal of any focal sepsis, &c. A second test-meal was given after general evidence was obtained that the ulcer had satisfactorily responded to medical treatment. Of the 27 duodenal cases, 22 showed a different test-meal after medical treatment had apparently been satisfactorily carried out, and in each case the difference was one in the direction of increased acidity. Five cases showed no variation, four of them originally showing a test-meal which brought them into hyperchlorhydria. One case was that of a man with duodenal ulcer, who had had several hæmorrhages, and deformity evident to X rays. He had hyperchlorhydria, and in every specimen there was a great excess of mucus. He had septic teeth and tonsils. He was treated on medical lines, and the septic foci dealt with. After the ulcer had responded well, the mucus disappeared and he had excessive hyperchlorhydria. Hyperchlorhydria seemed to be an essential part of the duodenal diathesis, not the response to the presence of active ulcer. The rise in acidity he attributed to the disappearance of the gastritis which was present, associated with active duodenal ulcer. In the 13 cases of gastric ulcer there was an increased acidity after the satisfactory conclusion of treatment in 10; the other three showed no rise, though there was no fall either. The final test-meal in that group showed ten cases with a test-meal belonging to the highest group—i.e., hyperchlorhydria—two were "high normals," and one was a hypochlorhydria, the latter having shown achlorhydria when the investigation was started. He suggested that the large number of achlorhydrias after treatment was due to the same factor as in duodenal ulcer, after the crater associated with it had disappeared. He hoped to continue the investigation and have a larger series to present.

Dr. T. L. **HARDY** (Birmingham) then read an abstract of a paper which appears in full on p. 711 of this issue.

Dr. W. **MORRELL ROBERTS** (Manchester) submitted a preliminary paper on the

Effect of Oils on Gastric Secretion.

The inhibitory effect of oils and fats on gastric secretion had, he said, been noted many times, but he was not aware of any explanation having been advanced. The diminished acidity of the gastric content in the presence of oil was not due simply to the fact that oil failed to stimulate secretion. It was said that oil inhibited secretion by forming a layer over the gastric mucous membrane, and so protecting it from stimulation by the food constituents, but this would not account for the inhibition of psychical secretion. The purer the specimen of oil used, the more pronounced was the effect, but there was still an unexplained factor which he had not discovered. Additions of oleic acid to pure oils did not greatly interfere with their efficiency. What did seem definitely to emerge was that the higher the iodine value of the oil used, the more effective was it in reducing the stomach secretion. The iodine values in the various oils used in the inquiry were as follows: linseed, 185; cod-liver oil, 153; pea-nut oil, 105; almond, 93; olive, 84. Though oil inhibited gastric secretion in varying degrees when stimulation was supplied by food in the stomach, it was unable to do so when the gastric cells were stimulated by histamine in the circulating blood. If it were true that psychical secretion were inhibited by oil, it must be in virtue of the action of the oil within the stomach.

Discussion.

The **PRESIDENT** (New Lodge Clinic) said he felt that Prof. Parsons was wrong in the view he expressed in his paper, and the reason was evident in contrasting his results with those set out in the paper of Dr. Copeman and Dr. Gray Hill. The children spoken of by Dr. Parsons were marasmic, whereas the other children dealt with were healthy. There was no particular reason why children with true constitutional achylia should be marasmic. He accepted the statement of Dr. Parsons that all the cases he described were instances of false achylia—i.e., they had not achylia. It was most important to distinguish between achylia and achlorhydria. Achylia gastrica was the complete absence of gastric secretion; achlorhydria was simply absence of free hydrochloric acid. Only very few cases of the latter were due to the former. In achlorhydria mucus was always present; and on washing the stomach out and then giving another test-meal there was, almost invariably, a return of free acid. The wrong treatment was to give these patients acid, because the physician could remove the gastritis and allow them to secrete their own acid by means of systematic lavage. Achylia gastrica he regarded as an inborn error of secretion, unaccompanied by any anatomical change in the gastric mucous membrane. This was strongly supported by the frequency with which the condition was familial. True achylia was chiefly found as an associate of Addison's anæmia. Occasionally one came across a true achylia gastrica in a person apparently healthy, and on going into the family history one learned that relatives had died of pernicious anæmia.

He did not agree with Dr. Patterson that there was atrophy of mucous membrane in pernicious anæmia, as the speaker had found that the cells were present, they simply were unable to secrete. Constitutional achylia was compatible with good health, though the subjects of it were predisposed to diseases more than were ordinary people. He did not think the position of the ulcer in the stomach had anything to do with the secretion. He believed that hyperchlorhydria was the cause of the ulcer, not the result. The recent work of Dr. Venables showed there was, in many cases before the gastric ulcer developed, an excessive acidity associated with a different type of stomach, a type which made the stomach a likely place for ulcer. Dr. Hurst contended that the person with the average stomach could not get an ulcer. And the development of a growth in the stomach did not produce the acidity, and no one had ever seen the acid gradually reduced and disappear as a result of carcinoma of the stomach.

Dr. E. P. **POULTON** (London) said he did not think it possible that a person could have normal cells in the stomach without producing hydrochloric acid; and if a cell ceased to function it must atrophy. Faber said he had never yet seen a case in which there had been complete absence of hydrochloric acid and absence of ferment too. The speaker suggested that all the cases of achylia were cases of achlorhydria, and probably owning gastritis as a cause. He considered that acid was very important in the initiation of an ulcer, but that it had no part in its continuance. Experimentally, the attempts to keep ulcer alive by means of hydrochloric acid had been disappointing. The chronicity was due, he thought, to mechanical changes. Success in the treatment of gastric and duodenal ulcer had been attributed to giving alkalis, but what was really given were alkaline carbonates and their stimulating action, liberating CO_2, and accelerating the emptying of the stomach.

Dr. G. W. **GOODHART** (London) appealed to investigators that when they were reporting experiments involving test-meals they should give readers an indication of the times of the emptying of the stomach; also as to whether there was a mixture of gastric contents or of gastric juice alone in an empty stomach. It detracted seriously from the drawing of accurate conclusions when these essential particulars were not stated. He considered that achlorhydria from carcinoma was much more common than achlorhydria from gastritis. If the President's view was correct that the carcinoma was always preceded by gastritis, Dr. Goodhart thought there should be far more cases of achlorhydria due to plain gastritis than were seen, unless a large proportion of gastritis cases passed on to carcinoma.

The readers of papers briefly replied.

SECTIONS OF COMPARATIVE MEDICINE AND NEUROLOGY.

ON March 27th a combined meeting of these Sections was held, with Major-General Sir JOHN MOORE, President of the Section of Comparative Medicine, in the chair, to discuss

Encephalomyelitis in Man and Animals.

The CHAIRMAN referred to the poisoning of animals by sewage, which, he said, led to nervous symptoms. During the late war he had been requested by General Headquarters to go and see a farmer whose property was on the lines of communication, and who had lost some animals, whilst others were ill, from alleged carbide poisoning of the ponds. It turned out that the cause was impregnation of the water by sewage.

Mr. I. A. GALLOWAY opened the discussion on behalf of the Section of Comparative Medicine, and dealt with diseases affecting domestic animals, in which the chief pathological changes were found in the nervous system. He spoke first of the enzoötic encephalomyelitis of horses, commonly known as Borna disease, from the locality in Saxony, where a severe visitation occurred between 1894 and 1896. This disorder was found on the continent and in America, but no cases, said Mr. Galloway, had so far been reported as occurring in this country.* It seemed to be the same disease as that met with in sheep and cattle. It was infectious, and experiments had shown that animals could be infected by introducing the virus into the nose or by ingestion. The extent of the spread of the disease seemed to be influenced by climate, for it was certainly more prevalent under moist atmospheric conditions and certain districts seemed to be especially affected. The mortality was always high, varying from 70 to 80 per cent., and the cause of the disease was a virus of ultra-microscopic minuteness. In spontaneous cases the incubation period had not been determined; in experimental cases a long time elapsed between inoculation and death. In the rabbit this period was about 30 days, in the monkey 89 days, in the rat or mouse 20 to 82 days, and in the horse 50 to 80 days. The lesions in the peripheral nervous system were important, as they suggested that the symptoms might not be entirely central in origin. Comparative studies had shown that the virus of enzoötic encephalomyelitis was disseminated in the animal organism like the virus of rabies, herpes, and poliomyelitis. Even in mild degrees Borna disease had a high mortality, and animals which recovered from one attack were not thereby rendered immune to a second one. It was not clear whether the second attack was due to reinfection or to a persistence of the first infection. Attempts had been made in rabbits to shorten the incubation period by giving intracerebral inoculations, but they had not been successful. Attempts had also been made to immunise rabbits by using a virus killed by heat, chloroform, carbolic acid or glycerin; but again without success. A formalised vaccine inoculated subdurally, with a second dose several days later, had protected 3 out of 11 animals (rabbits and monkeys).

Mr. Galloway also gave an account of the disease called paralysis of fowls, a specific condition described in Germany, America, and Holland, which he had recently found in this country. Among the symptoms were a partial and progressive paralysis of the wings and legs, sometimes associated with ocular disturbance, and these facts suggested that it was due to infection. In this disease also the chief pathological changes were found in the nervous system. In the peripheral nerves the essential feature seemed to be an intense infiltration with lymphoid plasma cells and large mononuclears. In some of the cases the whole nerve tissue seemed to be replaced by the infiltrating cells—an infiltration so intense as to be unequalled in any other encephalomyelitis. The myelin sheaths degenerated secondarily as a result of the infiltration. Similar infiltrations, chiefly vascular, were found in the brain, cord, and meninges, and also in the spinal ganglia. The disease could be transmitted to other chickens by intracerebral injection of emulsion of the nerve tissues of the paralysed fowls.

Dr. J. G. GREENFIELD said that from the pathological point of view there seemed to be three main groups of encephalomyelitis—those due to visible organisms, those due to a distinct species of neurotropic virus, and those which followed infective fevers. In the first of these groups the inflammatory process in the nervous system resembled that in other organs, except that nervous tissue seemed to be particularly vulnerable. Inflammation was found to be either focal or more diffuse according to the extent of distribution of the organism and the patient's power of resistance. The second group included encephalitis lethargica, Borna disease, rabies, and the herpes encephalitis found in rabbits. Here the virus was diffused throughout the nervous system, though it primarily attacked the neuron, probably by invading the nerve cell. Sometimes the nerve reacted by forming special structures, such as Negri bodies. Certain parts of the nervous system seemed to be especially liable to attack; examples were the selection of the substantia nigra in encephalitis lethargica and the hippocampus in rabies. The cases in the third class were characterised pathologically by focal demyelination without destruction of neurons, the foci being chiefly round vessels, along the walls of the ventricles, and round the margin of the cord.

Dr. W. RUSSELL BRAIN drew attention to an insufficiently recognised group of cases which had been tentatively described as acute infective encephalopathies. They comprised cases in which acute or subacute cerebral symptoms were produced by a toxæmia resulting from infection without the infecting agent being in the nervous system. Three clinical groups could be recognised: (1) those in which the symptoms were exclusively or mainly meningeal; (2) those in which there were both meningeal or cerebral and spinal symptoms; and (3) those having spinal symptoms without cerebral.

Prof. TOM HARE spoke of distemper and other diseases in dogs, and Mr. LESLIE PUGH gave a short account of work in connexion with a specific encephalomyelitis of the dog, independent of distemper.

MEDICAL WOMEN'S INTERNATIONAL ASSOCIATION.—This Association is holding its quinquennial meeting in Paris from April 10th to 15th, and it is expected that representatives from some 20 countries will attend. Beside the Council and general meetings there will be three scientific sessions on the afternoons of April 11th–13th, which will be open to all medical women. The subjects for discussion will be Sex Instruction for Children and Adolescents and Analgesia in Midwifery. The programme of social activities includes a reception given by the President of the French Senate at the Palais du Luxembourg, and another by the President of the Municipal Council at the Hôtel de Ville. Special arrangements have also been made for visiting the Radium and Pasteur Institutes, as well as several of the most notable hospitals of Paris. Further information may be had from the hon. secretary, Dr. L. Martindale, 28, Weymouth-street, London, W. 1.

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* Prof. James McIntosh lately stated in our columns (THE LANCET, 1928, ii., 1051) that he had found signs of the disease in a pony which developed it in the Island of Skye.—ED. L.

Reviews and Notices of Books.

MEDICAL HISTORY OF CANADA.

Four Centuries of Medical History in Canada and a Sketch of the Medical History of Newfoundland. By JOHN J. HEAGERTY, M.D., D.P.H. Bristol: John Wright and Sons, Ltd. 1928. In 2 vols., pp. 395 and 374 respectively. 50*s.*

Dr. J. J. Heagerty who is attached to the Canadian Department of Health, is to be thoroughly congratulated upon a valuable work, the title of which does little to convey the range and interest of the contents. Learning as well as industry have gone to the compilation of this record, for the volume is not only a survey of the medical history of Canada since the days of Francis I. of France and Jacques Cartier, but it provides a vivid picture of the medicine, surgery, and public health of the provinces and cities as they have developed, describing the whole machinery of sanitary government in the Dominion, while dealing fully with the epidemic diseases as they have been known to occur since European incursion brought with them their tales of infection.

The section on epidemic diseases with which the first volume commences is a particularly full one, forming a many-sided selection of notes upon the various pestilences against which the strict, and indeed inhuman regulations of quarantine were set up. Few readers would know exactly what to expect in a chapter headed "Ship Fevers," for the words "ship fever" and the popular term "yellow jack" were commonly interchangeable in nautical reports—i.e., "ship fever" was yellow fever. But it is clear from a chapter of lurid interest that under the name "ship fever" were also included typhus, which was particularly fatal to the numerous Irish emigrants of the middle of the nineteenth century, typhoid fever, plague, leprosy, and small-pox. Plague may have been an infrequent guest on board even the miserably ill-found vessels of the eighteenth century, but some of the records that are quoted show that it certainly did occur, the usual story being that the ship had departed from Marseilles where plague was ever rife to make for the important French settlement of Quebec. It seems that while in certain old records yellow fever and plague appear to have been used as identical terms, the differentiation between plague and small-pox was also quite hazy, and the symptoms of each might and probably were attributed to syphilis. An interesting chapter deals with "Mal de la Baie St-Paul" which is described at considerable length without any exact conclusion being come to as to its nature. The greater number of the symptoms could be accounted for on the supposition that the patients were the victims of syphilis disseminated extra-congenitally, but syphilis of a form with which we are to-day not familiar.

The distinctly clinical section of epidemiology is followed instead of preceded by a section describing the pioneer physicians of Canada, the early medical journals, the early scientific societies, and the development of public health departments. This section is completed in the second volume, the rest of which is made up of the history and descriptions of the medical schools and hospitals of the Dominion, while the story as it occurred in Newfoundland appears in an appendix.

The information upon medical journalism will be informing to the increasing number of practitioners who take an interest in the development of medical literature. The first medical journal published in Canada—namely, the *Quebec Medical Journal*—appeared in 1826, and had among its editors the founder, Dr. Xavier Tessier, and a committee among whom were the Quebec physicians Joseph Painchaud, Joseph Parent, Joseph Morrin, François Blanchet, C. N. Perrault, P. M. Bardy, and W. A. Hall, and the Montreal physicians Caldwell, William Robertson, and John Stephenson. The large element of French thought continued to be represented much later when the *Dominion Medical Journal* was published in Toronto for the first time in the city of Toronto in the year 1868, the *Lancette Canadienne*, the French medical journal of Montreal having disappeared some 20 years earlier. Then in the year 1872 came the *Canadian Medical Record* of Montreal, the *Canadian Medical and Surgical Journal* of Montreal, and *l'Union Médicale du Canada* also of Montreal. *L'Union Médicale du Canada* was in the beginning a quarterly but later was published as a monthly when it was known as the *Revue Mensuelle de Médecine et Chirurgie*. It is still being published. The more modern developments of medical journalism in Canada need not be recapitulated, but their origins and provenence are fully set out and form a curious bibliographical note.

No purpose would be served by a summary survey of the pages of these handsome volumes; the work is eminently readable as well as worth reading, and we commend it to readers for their study. The lessons in medical politics to be derived, almost unconsciously, from historic records of this sort are often of unexpected aptness.

DISEASES OF THE LIVER, GALL-BLADDER, AND BILE-DUCTS.

Third edition. By Sir HUMPHRY ROLLESTON, Bart., K.C.B., M.D., Hon. D.Sc., D.C.L., LL.D., Regius Professor of Physic in the University of Cambridge; Emeritus Physician, St. George's Hospital; Sometime President of the Royal College of Physicians of London; and JOHN WILLIAM MCNEE, D.S.O., M.D., D.Sc., F.R.C.P., Associate Physician to University College Hospital. Illustrated. London: Macmillan and Co., Ltd. 1929. Pp. 884. 42*s.*

SINCE the second edition of this book was published in 1912 many advances in the subject have been made which have necessitated considerable additions. Particularly is this true with regard to jaundice. The subject is approached with a review of the more important recent experimental advances, and a statement of the present theories and known facts of the physiology of bile-pigment and bile-acid formation. A discussion follows of the van den Bergh reaction, the technique of which is given in an appendix at the end of the book, and the influence that this test has had on the classification of various types of jaundice into obstructive hepatic jaundice, toxic and infective hepatic jaundice, and hæmolytic jaundice. "Catarrhal" jaundice is placed in the second group, and the view is expressed that it is due to an infection involving both bile-ducts and liver cells rather than to an obstruction at the lower end of the common bile-duct, as was suggested by Virchow.

In the chapter on tests for hepatic function due emphasis is laid upon the fact that the multiplicity of reactions controlled by the liver makes it impossible to estimate the efficiency of the organ as a whole by chemical methods, which are chosen to test quantitatively some single function of the organ. If the lævulose test shows impaired carbohydrate function, it does not follow that the action of the liver on proteins is also impaired. The various tests for hepatic efficiency are therefore discussed in relation to the specific metabolic activity that they are designed to test. They include tests depending on the excretion of dyes by the liver, on carbohydrate, fat, and protein metabolism, on the formation of fibrinogen, on the detoxifying power of the liver, the Widal hæmoclasic function, and the biliary function. The technique and value of each test are briefly discussed. The radiological diagnosis of diseases of the biliary tract are well described, with a brief history of the development of the technique now practised, and the methods of administration and value in X ray diagnosis of iodine and bromine compounds. The ample references in the text and excellent index add to the value of this work. Many accounts of actual cases are given, and 54 fresh illustrations have been added.

The whole book is up to date, and provides a complete account of present knowledge of diseases of the liver and its appendages.

Surgery of Joints.

Die Chirurgie der Gelenke und Schleimbeutel. By Profs. E. Seifert, E. Stahnke, Med. Rat. Prof. F. König, all of Würzburg. Berlin and Vienna: Urban and Schwarzenberg. 1928. Pp. 315. M.20.

This instalment of a work designed on an encyclopædic scale is not unworthy of its foregoers. It is fasciculus 23 of Vol. II. of the second part of "Die Chirurgie," a comprehensive presentation of general and special surgery edited by Prof. Dr. M. Kirschner, of Tübingen, and Prof. Dr. O. Nordmann, of Berlin. Its authors show a tendency to lay more stress upon rarities and novelties than on the everyday subjects of surgical work and demonstration. For instance, we find that four pages and a coloured plate are devoted to Kienbock's disease of the semilunar bone of the wrist, whereas gonorrhœal arthritis gets just three. On the whole this fasciculus, despite its size, gives us the impression of treating its subject matter in a sketchy manner. Eight pages only are given up to a discussion of tuberculous disease of the hip. Section A of this fasciculus treats of the surgery of joints, excluding tuberculosis; Section B of tuberculosis of joints, and Section C, which consists of only six pages, deals with surgical diseases of bursæ.

The volume contains no details of treatment, only a very few illustrations of appliances, no descriptions of operations, and no discussion of the best ways of treating chronic joint disease. Osteo-arthritis, which is known in Germany as arthritis deformans, receives the fullest consideration among non-tuberculous lesions, but what is distinguished in this country as rheumatoid arthritis is passed over cursorily.

Perhaps the details of treatment will receive full consideration in another fasciculus, but we have failed to find any mention of such a one in the prospectus of the work as advertised on the cover.

Comparative Anatomy.

The Frog. Twelfth edition. By the late A. Milnes Marshall. Edited by H. G. Newth. London: Macmillan and Co. 1928. Pp. 182. With 40 figures. 6*s.*

It is a pleasure to see yet another improved edition of this incomparable "introduction to anatomy, histology, and embryology." Since 1882 it has guided innumerable students into the true faith, and its solid soundness will, we hope, carry it on indefinitely as a very good book. Mr. Newth's alterations and improvements are conceived in the right spirit of respect for a tradition which ought to be maintained. A brief account of the original author, with perhaps a portrait, would be an improvement.

Contributions to the Principles of Morphology. By W. B. Crow. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1929. Pp. 94. 5*s.*

An interesting quiet essay, approved as a thesis for the degree of D.Sc. Lond., on the general ideas underlying our conceptions of individuality, classification, and phylogeny, treated historically. It will be a useful help to orderly thought.

The Principles of Applied Zoology.

By R. A. Wardle, Professor of Zoology in the University of Manitoba. London: Longmans, Green and Co., Ltd. 1929. Pp. 427. With 55 text figures. 21*s.*

By "principles" Prof. Wardle means "elements," and no one need be afraid of finding here a philosophical treatise on fundamental conceptions. The book is just an amazing mass of well-arranged facts (or near-facts) of quite unusual interest which come under the common head of relating zoology to human affairs. Part I. deals with medical and veterinary zoology—protozoa, worms, and insects in relation to disease. Part II., on agricultural and horticultural zoology, contains chapters on insect pests (as one would expect from the author, very thoroughly prepared), vermin, bird encouragement, livestock and their breeding. Most readers other than hard-pressed students will probably find the account of animal industries in Part III. the most entertaining: bees, silkworms, fisheries, whaling, and a long account of the fur industry. There is a close-printed bibliography of 27 pages. The book appeals to so many interests that it ought to be widely popular—how to avoid malaria, how to kill caterpillars, and how to choose your wife a fur coat (the synonymy of the fur trade is remarkable) are seldom described in the same volume. We congratulate Prof. Wardle on having added the best to the series of good books which he has written.

Artificial Pneumothorax.

Essai sur le pneumothorax artificiel bilatéral et simultané. By Dr. Jean Terrasse. Paris: Louis Arnette. 1928. Pp. 116 and plates. Fr.45.

The number of books on collapse therapy of the tuberculous lung is legion. This book breaks no new ground; it is a short and lucid exposition of the reasons for applying the method of artificial pneumothorax, its risks, its effects on diseased and sound lung, and the complications which may ensue. Considerable space is devoted to bilateral artificial pneumothorax both by the method of collapsing one lung and later the other, and by the method of simultaneous partial collapse with small quantities of air. Oleothorax is mentioned in passing, but very little space is devoted to all the accessory operations which have now grown up around the original pneumothorax technique. There is no description of various types of apparatus. Quite half the space in the book is taken up with descriptions of cases with temperature charts, radiograms, and chest diagrams, a method of exposition which is apt to become tedious to those who have not seen the patients. The book contains a useful short bibliography. We are glad to note that the author emphasises the importance of the general hygienic treatment, with adequate periods of rest, of patients undergoing treatment by artificial pneumothorax. Without this precaution the whole benefit of the method is lost.

Practical Bacteriology.

By Fred W. Tanner, Ph.D., Professor of Bacteriology and Head of the Department, University of Illinois. New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd. 1928. Pp. 235. 12*s.* 6*d.*

This book is a companion volume to the author's "Bacteriology," and has been designed so as to introduce students to bacteriology as a pure science and not necessarily or solely to the examination of pathogenic micro-organisms. A course of actual laboratory classes is outlined, and the way in which it can be carried out thoroughly is indicated. The student is told the value of an intimate knowledge of his tools and descriptions follow of the microscope and how to use it; of glassware and its toilet; of the preparation of media, and of cotton-wool plugging. Most of the usual methods are adequately dealt with but fuller details of filters might have been included, and it seems a loss that the final advantage of the McIntosh-Fildes anaerobic jar was not added to the account of the Novy jars. In the section on stains no distinction is made between acid-fast and acid-alcohol-fast bacteria. Five pages are devoted to the Gram stain, yet no formula for the original method has been given. Some American modifications only have been set out, and it is noteworthy that whereas all descriptions of the original Gram expressly preclude washing with water, the methods here advocated allow it.

This practical course has been conceived on original lines and should achieve the author's purpose of widening the study of bacteria and fungi.

THE LANCET.

LONDON: SATURDAY, APRIL 6, 1929.

GASTRIC SECRETION.

HE secretion of the stomach plays an important ; in human economy, and many are the functions :h have been attributed to it. The gastric juice luces physical changes in the contents of the us, bringing them to body temperature and icing them to a fluid or semi-fluid state suitable passing on into the intestine ; it acts chemically any of the substances of the food, reducing native eins to albumoses and peptones, and changing inogen to casein. Fat, too, is partly digested he stomach by means of a fat-splitting ferment. sted food is to a certain extent sterilised by the ochloric acid of the juice, while the mucus ed out by the surface epithelium protects the g membrane of the whole tract from the action rritant substances. Gastric secretion exercises mportant function in the body by influencing the -base equilibrium ; it has even been suggested the stomach may at times act as an excretory n in ridding the body of toxic substances, as in remesis gravidarum. Our knowledge of the ic secretion has been obtained partly by means *periments on animals, partly from observations* atients with gastric fistula, and more recently stomach contents of patients have been with- n at intervals after giving a test-meal of varied osition, chemical analyses being made of the eeds. The experimental methods of observing gastric secretion in animals were initiated in 8 by Heidenhain, who artificially isolated a ion of the fundus of a dog's stomach from the of the organ, and were elaborated by Pavlov is pupils at the end of the century. Pavlov entiated three phases of gastric secretion in the In the first phase, the sight or smell of food, chewing of food in the mouth even though llowed, led to a considerable secretion of gastric through the vagi nerves. A second phase d as the result of the chemical stimulus of digested foods acting on the mucous membrane pyloric antrum ; it was thought at one time he resultant effect on the secretory glands of ndus of the stomach was brought about by agastric reflex through the intrinsic nervous s of the stomach, but it is now believed that nulus is carried by the blood in the form of a y hormone, the gastric secretin first described INS. A third stage is that brought about nical stimuli of food products in the duodenum all intestine ; this phase, though not intense, long continued. The first or psychic phase e which specially interested Pavlov and led to the remarkable researches in experimental gy which have occupied his later years. The experiments were continued, however, by s and assistants, and a considerable literature n up on the subject, which has been dignified name of the science of chymology. Pavlov's sistants, B. P. Babkin and E. S. London, lected the results, which show that the of foods and their evacuation from the are controlled by a remarkable series of and motor involuntary reflexes

Carefully devised experiments on healthy dogs, in which, by means of fistulæ, the material from gullet, stomach, duodenum, and gall-bladder can be obtained in pure state, have enabled the complicated processes of digestion to be dissected into their elements. It is found that what appear to be intricate physiological phenomena can be reduced in essence to a close approximation to simple physico-chemical laws. Given the right conditions, the stomach has the character of a test-tube, in which the course of digestion of minced meat, for example, is found to follow a logarithmic curve showing the closest approximation to a theoretical curve laid down by S. Arrhenius for digestive ferment action ; while a starch meal solution, which is unaltered in the dog's stomach, is passed on into the duodenum at a rate conforming to a simple monomolecular formula. Moreover, the quantity of gastric secretion is proportional to the square root of the quantity of food ingested, while the duration of digestion or the length of time taken to evacuate the stomach is also proportional to the square root of the quantity of food ingested into the stomach. That is to say, the quantity of secretion and the time of digestion are found to bear a very simple quantitative relationship to the amount of food. The course of digestion for meat and fats was determined—starch is not digested in the dog's stomach—and it was found that in a mixture of foodstuffs each follows its own course of digestion, so that the digestion of milk which contains all three could be dissected into a series of separate processes affecting each of the constituents independently. A mixture of foods makes the analysis more difficult but not impracticable. In man, however, it was soon found that an analysis of the stomach contents on a mixed diet was too complicated to afford useful information, and various types of test-meal were introduced. In these a food or simple mixture of foods is given, and after a specified time or at intervals a portion or the whole of the remaining stomach contents is removed. The older test-meals of Ewald and Boas gave useful information about the gross secretion of hydrochloric acid and pepsin, but necessarily represented the static position which the digestive process had reached in the time allowed. As the chemistry of the stomach is constantly altering, the newer methods have aimed rather at giving an estimate of the kinetics of the processes involved. The substances used in test-meals have become simpler and more indifferent, while fractional portions of the stomach contents removed at intervals afford material for analysis of a series of stages of digestion. The test-meal introduced by Rehfuss in 1914 is now used widely in the United States and in this country. In Germany preference is given to the alcohol test-meal of Ehrmann, or a plain meal of water containing pure caffein devised by Katsch. Such simple test-meals, containing no protein or salts, are recommended because of the ease of determination of the true acidity, for this is only approximately assessed by titration methods in the presence of buffering substances like proteins and salts.

The interpretation of the test-meal results has given rise to a good deal of controversy. Considerable variations occur without being outside normal physiological limits, but certain types of result are almost characteristic of certain types of stomach. Even in a number of apparently healthy people hydrochloric acid is entirely absent throughout the digestive process ; Bennett and Ryle[1] found 4 per cent. of a series of normal people to be achlorhydric. In others acid secretion is more active than the average. Hurst, who has contributed so much to the advance of knowledge of the clinical physiology and pathology of digestion in this country, holds that in many instances these features are inherent in the make-up of the individual, and are in the nature of inborn errors of secretion.[2] According to this view, there is on the one hand a congenital over-secretion of hydrochloric acid by the stomach, a veritable gastric-ulcer diathesis; while in other cases there is a true achylia gastrica of constitutional origin. Faber[3] holds that a condition of preceding gastritis underlies both the variations in hydrochloric acid secretion and the origin of ulcer. Special importance is given to a localised gastritis of the pyloric region, which may give rise to the pyloric syndrome, involving alterations both in the acid secretion and in the emptying of the stomach. From estimating the total chlorides, inorganic chlorides, and free hydrochloric acid or active chlorides, Bolton and Goodhart[4] came to the conclusion that the acidity was neutralised towards the end of digestion by a reflux of strongly alkaline pancreatic juice. This process of regurgitation of duodenal contents had been observed by Boldyreff in animals, who found that it regulates the gastric acidity and that hyperacidity is generally due to defective neutralisation. Pavlov had observed that some neutralisation of the hydrochloric acid takes place by the mucus secreted by the stomach wall. The idea has been put forward by MacLean[5] that the stomach automatically regulates the hydrogen-ion concentration of its contents, and that at a stage of digestion pepsin ferment may continue to be secreted by the stomach wall in the presence of neutral chlorides. In the natural process digestion comes to a standstill by the action of extragastric inhibitory nerves. It may well be that the problems of gastric secretion and digestion in the human stomach will yield to inquiry, and that in man also time will show that the results can be stated in terms of physico-chemical laws, but much work remains to be done before this can be realised.

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[1] Guy's Hospital Reports, 1921, lxxi., 286.

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THE POWERS OF THE POLICE.

The Royal Commission on Police Powers and Procedure, presided over by Lord Lee, has discharged the first duty of a Royal Commission by producing a unanimous report.[6] Points of special interest to the medical profession are few. Fatigue in witnesses was considered. There have been criticisms that the police, when taking statements, as in Miss Savidge's case, prolong the examination unduly in order to extract admissions by mere exhaustion. The Howard League of Penal Reform proposed a time limit of five hours (with an interval)—the length of a normal court session. The Royal Commission deprecates any time limit; unless fixed absurdly low, a rigid limit would be too long for some people and unnecessarily short for others; moreover, the very existence of a limit might not only lead the police to be careless in watching for signs of fatigue but might even encourage a policeman to press his questions unduly as the end of the period approached. The police, says the report, should watch the deponent for any signs of exhaustion and should offer a break (with or without refreshment) at suitable intervals, or even a postponement to the next day; nor should the witness be asked to sign a statement at the end of a long and tiring interview; ample time should be allowed for careful study before signature. A question on which members of the medical profession will be capable of forming a conclusion is whether statements from women and children in sexual cases should be taken by men or women. The Bridgeman Committee on the Employment of Policewomen recommended in 1924 that, so far as practicable, arrangements be made everywhere for the taking of such statements by policewomen. The Departmental Committee on Sexual Offences against Young Persons spoke, in 1925, of the fact that parents and teachers report offences more readily when they know that a girl will make her statement to a woman. That Committee was impressed by the general evidence that many girls suffer from shock as a result of these offences and that further distress is lessened if, in the first instance, the story is told to a woman. Lord Lee's Commission agrees that a sufficient number of qualified and specially trained women should be made available to take statements from all young girls and children in sexual cases. The report suggests that the women thus selected need not be attested policewomen; when it goes on to say that they should be of high character, suitable temperament, good education, and adequate training, it seems to offer prospects of useful and responsible employment to women who have taken medical degrees. The Royal Commission is dissatisfied with the present compromise under which, when a suitable woman is not available, the statement is taken by a male officer in the presence of a second woman. The latter is present in part, it appears, to protect the policeman from subsequent accusation, but the Commission regards this mixed audience as being, from the point of view of the person making the statement, "the worst possible arrangement and the most embarrassing which could be devised for the narration of the details of some sexual offence." The report has a good deal more to say on the employment of policewomen, on the understaffing of the police force, on the duties of the Director of Public Prosecutions, on cautioning suspects, on agents provocateurs, and other matters. In training the police the aim should be, says the Royal Commission in a medical metaphor, the production of "general practitioners" rather than of specialists.

There are some healthy observations on the difficulties of the police, and the consequent danger to the good relations between police and public, where the police are called upon to enforce laws which are out of harmony with public opinion. These disputable offences are refreshingly summed up, and the clarification of the law is demanded. There is street betting where public opinion is tolerant and the police must expect more hindrance than help. There is the dubious law of lotteries; the local diversity of policy towards whist drives leads the Commission to suggest that the Home Office should make up its mind and issue clear instructions. There are also the offences against public decency and street offences like solicitation. Private citizens are reluctant to complain of "annoyance," and thus the cases come to be decided on police evidence alone. The defence usually involves attacking the police, and, while one section of the public complains that the policeman is too busy, another complains that he is too inactive and hints at connivances due to corruption. All the while the energies of the police are being increasingly diverted to many miscellaneous duties outside their primary function of preventing and detecting crime. They are engrossed with motor traffic and with many new offences which bring the law-abiding citizen for the first time into an unaccustomed conflict with the law and consequently cause a state of friction. The Commission finds it significant that many complaints have proved to be directed not so much against the policeman as against the laws which he has to enforce. Far the most frequent allegations of dishonesty against the police appear to concern offences which, though infringements of the law, are not popularly regarded as morally reprehensible. In criticising the excessive zeal of certain chief constables, the report has a sentence worth quoting: "In our view a grave responsibility rests on those who create criminal offences which are not precisely or clearly defined, or in respect of which the requisite evidence to support a conviction cannot be obtained by straightforward and unequivocal methods."

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[2] See The Lancet, 1928, ii., 305.

[3] Ibid., 1927, ii., 901.

[4] Ibid., 1922, i., 420.

[5] Journal of Physiology, 1928, lx., 63; and lxvi., 356.

[6] Cmd. 3297, 1929. Published by H.M. Stationery Office. 3s.

The Royal Commission was not empowered to take evidence on oath, so did not investigate the truth or falsity of allegations and counter-statements in particular cases, but it has made a searching examination into police administration. The English policeman emerges with his high reputation unshaken. In particular, no creditable proof has been found of the use of "third degree" methods. As an illustration of the lengths to which such methods may be carried in other lands, an appendix to the report reprints from THE LANCET [7] an article on Cross Examination under Anæsthetic, in which we recounted last year an attempt at Hawaii to extract a confession of murder by means of an injection of hyoscine.

ECONOMICS OF THE NURSE'S TRAINING.

SCIENCE cannot save lives or cure disease until it is applied, and to a large degree the application of medical science is through the art of nursing, and its ultimate success rests on the full development of this art. Some understanding of the scientific principles underlying the art of nursing is essential, and for the safety of the public the State has prescribed a minimum standard of knowledge and training before granting the title of nurse. But what is suffering at present is the art of nursing, since hospitals have now accepted the dual task of nursing the sick and educating the nurse where formerly many of them only recognised their obligation to do the former. Satisfactorily to fulfil both obligations might involve doubling the staff with a proportionate increase in administrative expenditure, a financial burden which would be unbearable under the present system. And yet both obligations must be fulfilled if hospitals are to prosper as they should, and this will mean, as Dr. E. C. HADLEY points out in a thoughtful contribution to the *Nursing Times*, the passing of the present transitional period in the history of the nursing profession. No nurse can become efficient in her art without continued practice in actual bedside nursing under skilled supervision which should never be relaxed. But the breathless rush of routine within our hospitals to-day is not consistent with any of the underlying principles of nursing and leaves practically no margin of time for organised and efficient bedside instruction. The responsibilities of a ward sister to the medical and administrative staff are too engrossing for her to fulfil her other duties as an instructor of nurses. Nor is the student nurse under the present regime in a fit state, physically and mentally, to benefit by her instruction.

And why? Her time is now occupied (we reproduce Dr. HADLEY'S list) with: cleaning, sweeping, and polishing floors in wards and adjacent rooms; scrubbing shelves, cupboards, lockers, sinks, and sluices; polishing taps and brasses; lifting beds about, not simply empty beds but often with the patient; mending and patching garments and other sewing jobs; washing up crockery, pots and pans, tea urns. But, as he remarks, the student nurse has plenty to do and to learn without doing work that belongs to a labourer or house porter, ward maid or charwoman, seamstress or domestic servant. Probationer nurses have come to do this work because their labour can be bought cheaply, although not now so cheaply as in the past. The problem of nursing education is essentially an economic one. A nurse cannot become skilled without the actual performance of services and it is for the hospital to determine fairly what those services are worth in the terms of the labour market. We think it safe to predict that when this is done the nurse will be found to be paying in service more than the equivalent of what she receives in education and training. It is manifestly unfair to the student nurse to demand from her service which does not tend to develop her skill and this is what many hospitals are doing. The solution will be found in the endowment of training schools or by adequate grants for training from the Board of Education. To educate the nurse both in the science and art of nursing should prove to be a good investment both for the public and for the medical profession, but until nurses themselves awake to the potentialities of their calling and demand the right conditions for the practice of their art, as the medical profession has done before them, the problem will remain unsolved. What these potentialities are has scarcely even been explored. The value of Dr. HADLEY'S article lies in his vivid realisation of the value to medicine of the properly trained nurse. We agree with him that her training and education merit the same care and consideration which is given to those of a medical student.

Annotations.

"Ne quid nimis."

THE KING.

WE published in THE LANCET of March 23rd the official bulletin issued from Craigweil House on March 16th. Another bulletin was issued from the same residence in the evening of Friday, March 29th, as follows:—"His Majesty the King continues to make satisfactory progress in spite of tiresome rheumatism round the right shoulder. Weight is increasing, appetite is returning, sleep is of better quality. The insistence on a lengthy abstention from all but essential public duties and a quiet life in the present suitable climate is being justified in the steady improvement in His Majesty's bodily and mental vigour." The bulletin was signed by Sir Stanley Hewett and Lord Dawson of Penn.

THE PREVALENCE OF SPINAL IRREGULARITIES

A PAPER lately published by B. C. Cushway and R. J. Maier [1] is of considerable interest to anatomists and to surgeons, especially those engaged in industrial practice. Under the title of Routine Examination of the Spine for Industrial Employees they record their findings in the radiological examination of the spines of 031 men who applied for work as switchmen and firemen on the Belt Railroad, Chicago. These men had previously passed a rigid preliminary physical examination without any visible anatomical variations or disturbance in function being found.

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[7] THE LANCET, 1928, ii., 990.

[1] Jour. Amer. Med. Assoc., March 2nd, p. 693.

and none of them was aware of anything wrong with the spine. The primary object of the inquiry was medico-legal; it was intended to protect the *employer from subsequent claims for compensation* after injury, based upon radiographic evidence of spinal abnormality which might have existed before, and have nothing to do with the injury in question. When such a claim is made it is manifestly impossible for the expert witness to say how long the abnormality as shown on the radiogram has been present, and often he cannot decide whether it is ante- or post-traumatic. Variations from what osteologists describe as the normal anatomy of the spine are very often met with; they may affect not only the form but the number of the vertebræ. But we were not prepared to learn, as we do from this paper, that out of 931 cases as many as 414, or over 45 per cent., showed some congenital abnormality, the total number of variations from normal being 605. It is surprising to find that 81 cases of scoliosis and 13 of tuberculosis, as well as some cases of old fracture of ribs, vertebræ, and pelvis had escaped detection by the rigid preliminary physical examination. The total number of congenital and developmental anomalies recorded was 510. The commonest developmental defect was a partial failure of the two lateral halves of the column to unite in the middle line, constituting spina bifida occulta. This condition was found in 161 cases. We are not told whether in any of them there were any clinical signs of spina bifida. Proliferative changes such as arthritis or calcification of the ilio-lumbar ligament were recorded in a considerable number of cases. No statement is made of the ages of the subjects of this inquiry, but presumably some of them had reached middle age when so-called rheumatic troubles might be expected. The observations are very interesting, but their value for us is diminished by lack of data for comparison of the conditions of employment in the United States and in Great Britain. It appears, however, that just as complaints of pain in the lower back seem to be commoner in the "white collar" classes in America, so complaints of injury to the back are relatively numerous among workers in factories and railroads and the like. Be that as it may, it is clear that a record of the condition of every workman's spine at the time of his engagement must be of great value in determining claims for compensation in the event of his being injured afterwards. The taking, examining, classifying, and storing of radiograms must be an expensive business, however, and is only justifiable when workmen are engaged for more than a short time. It would be impracticable for casual labourers. The authors' statement that each individual "may be identified by a rontgenogram of the spine just as definitely as by a photograph of the face or by finger-prints" strikes us as somewhat hyperbolical in the present state of radiography, at any rate as regards ease of identification. They themselves admit that they found it very hard at first to distinguish the normal from the abnormal, largely because of uncertainty about what should be considered normal.

OPIUM IN CHILDHOOD.

OPINION is sharply divided upon the use of opium in therapeutics, and nowhere is this difference of opinion so marked as where it concerns the use of the drug in the diseases of childhood. Sydenham and, later, Charles West urged the calming properties of opium and its derivatives, but Trousseau, in particular, emphasised the dangers of the drug with his statement that in breast-fed infants half a drop of laudanum in the course of 24 hours might produce symptoms of severe narcosis. Whatever may be said on this side, opium is too valuable a drug to be lightly abandoned in pædiatric practice, and it is interesting to read a paper in which G. Blechmann and P. Delthil[1] discuss how and when it should be employed. In the first place, they remark that most of the accidents following the administration of opium have been in cases where laudanum was used, and they believe that the child is better able to tolerate *the isolated alkaloids than complex preparations such* as laudanum. Moreover, the condition of the child is important, and it is well known that a dose that would be poisonous to a normal child is well tolerated by the sick child who is in pain. These writers believe that most of the dangers attendant upon the use of opium in childhood can be obviated if the drug is taken freely diluted and if the dose is spread out over 24 hours. As regards the form in which it should be given, they observe that laudanum has always been popular, and if the above simple rules are observed, then a dosage of two to three drops per year of age should be considered as normal. Paregoric provides a convenient way of giving more dilute doses of the drug, and Dover's powder is regarded as an excellent preparation, especially for pulmonary disorders, where its sedative action is counterbalanced by the expectorant effect of the ipecacuanha. If morphia is to be employed it must be well diluted, and it is recommended that a 1 in 1000 solution should be used for the infant, and in this way 1·5–2·0 mg. of morphia per year of age in divided doses may be administered. (This is equivalant to approximately gr. 1/40 to 1/32. The official B.P. injection of morphia is a 1 in 40 solution of the tartrate.) Papaverine is a preparation very little used in this country, but in view of its selective action on unstriated muscle it is recommended for such conditions as asthma and whooping-cough. As to the indications for the use of opium, the severely painful colics calling for such a powerful sedative are not so common in children as in adults. Certain spasmodic conditions, however, do occur, and Blechmann and Delthil mention in particular laryngeal spasm. Injections of morphia for these troublesome conditions they consider remarkably effective, but an adequate dose must be employed. In asthma, on the other hand, they think opium should not be used in children except for the occasional exhibition of Dover's powder for troublesome catarrhal attacks. In this connexion they discuss the question of opium in diseased conditions of the respiratory system, pointing out that while the drug certainly calms an irritating cough it must be remembered that the cough may be essential if the child is to clear its inflamed bronchi. Hence the type of cough must be carefully considered, and if opium is to be used, then Dover's powder is the best form. Probably the most important uses of opium in childhood are in diseases of the alimentary system, and it is just here that opinion is so divided. Opium has a triple action on the digestive tract; it reduces peristalsis, diminishes secretion, and calms painful conditions. There are certain disorders in infancy where it is extremely valuable. A type of diarrhœa with excessive peristalsis after each meal, with attacks of colic and sometimes vomiting, due apparently to irritation of the bowel, often yields to opium and nothing else. On the other hand, in the infective diarrhœas opium is almost prohibited, at any rate during the acute stages, although later on, as diet is gradually returning to normal, opium may be very helpful in aiding the infant to regain tolerance for foodstuffs.

In summing up their views the authors of this lucid review insist that opium is too valuable a drug to fall into disuse. They emphasise that the indications for its administration must be clearly appreciated and that safety lies in diluted preparations in which the quantity needed to produce the required result is divided over several doses.

FATIGUE AND EXHAUSTION.

MUSCULAR fatigue has had much attention from physiologists and a good deal of light has been thrown on it of late. But the state of mental or "nervous" exhaustion with which all clinicians are familiar, and which many dismiss as "neurasthenia," is still for the most part unexplained. We are apt to attribute states of nervous exhaustion to severe mental or emotional stress—psychic trauma—and to rely upon subjective symptoms as the sole guide to the degree of fatigue. Attempts to elicit objective signs of nervous exhaustion have met with little success, though clearly any such diagnostic measures, if reliable, must have great clinical value.

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[1] Rev. de Méd., 1928, No. 8, p. 1061.

Dr. R. D. Gillespie[1] has studied the problem, in a number of patients complaining of severe and persistent fatigue, from the hypothesis that many, if not most, forms of mental illness consist in a state of fatigue and that the symptoms are signs of it. Investigation along clinical lines failed to produce any objective test which was generally applicable. Most authorities agree that the blood pressure tends to be lower and the pulse-rate higher in exhaustion than in good health, and this was the case in Gillespie's patients. The persistently low blood pressure commonly found in post-influenzal debility may be mentioned in this connexion. On the other hand, a low blood pressure and high pulse-rate cannot be regarded as a constant finding in nervous exhaustion. The "lability" of the heart is also thought to be excessive in fatigue, and the changes in pulse-rate and blood pressure when a patient stands up after being recumbent were studied by Gillespie on the basis of Schneider and Truesdell's normal figures obtained from 2000 unselected cases. In the normal there is a slight fall of pulse pressure on getting up, due to a rise of the diastolic and a fall in the systolic pressure. In the fatigued patients examined this fall was found to be almost double the normal; but the pulse-rate for the most part increased no more in the exhausted than in the normal subjects. Examination of the vital capacity, of the basal metabolic rate, and of the reaction to "autonomic" drugs gave no constant abnormality that could be classified as indicative of a state of fatigue. The red blood cell count and the hæmoglobin percentage were equally unprofitable, as is hardly surprising when we remember that many patients with severe primary anæmia are but little fatigued—their state being in striking contrast to the pronounced exhaustion often seen in secondary anæmia where the colour-index is much reduced though the actual anæmia may be far less.

Biochemical tests may offer the most hopeful line of advance, and it is significant that sugar tolerance was diminished in more than a third of Gillespie's patients. Taranowitsch[2] has noted a great increase in organic phosphorus in the urine in prolonged mental work associated with exhaustion; in one case he found nine times as much organic phosphorus in the work period as in the resting condition, though the total phosphate excretion was but little increased. This change in the ratio of organic to inorganic phosphorus excretion is the more interesting when it is remembered how important a part the phosphatides and lipoids play in nervous histology and metabolism. The significance of lactic acid in the blood and excretions is dependent rather upon muscular than upon nervous activity, and the much less intense metabolism of nervous tissue is against the likelihood of any marked changes in the output of this substance in nervous exhaustion. The rôle of the endocrine glands is one which will doubtless become clearer as research continues. The secretion of adrenalin, for example, is increased in states of exhaustion, and this substance is said to be capable experimentally of increasing the capacity of tired muscles to respond to stimuli. The work of Kühl[3] and others has suggested that the cortex of the suprarenal glands may be even more important than adrenalin in protecting the body against exhaustion, and its deficiency may be the essential factor in the extreme collapse of Addison's disease. Bast and collaborators[4] have produced nervous exhaustion in rabbits by preventing sleep and have found conspicuous changes in the suprarenals, especially in the cortex, in 13 out of 14 animals examined. Gillespie, however, does not find that insufficiency of sleep or the presence of focal infections bears more than an associative relationship to feelings of generalised fatigue. This is the more remarkable since the importance of chronic toxæmia is being more fully recognised in the ætiology of many and various pathological conditions. Gonadal hormones are also put forward by some as possibly at fault in nervous exhaustion, and the close association between sexual activities and mental depression and fatigue seems to support this possibility. That emotions—often of sexual origin—may powerfully act on bodily functions is universally recognised; we need only mention the cases of "disordered action of the heart" following war stresses, of hyperthyroidism directly resulting from shock, or the "diarrhœa of fright." Hyperglycæmia, altered coagulability of the blood, and rise of blood pressure are some of the indices that may tell of the degree and extent of emotional stimuli. How far such emotions, if excessive, may cause permanent changes that we may estimate in terms of "fatigue" is as yet unknown; but our knowledge is likely to increase rapidly through further work along biochemical lines and by the search for functional tests of endocrine activity.

ANOXÆMIA IN TUBERCULOSIS.

THE "traditional belief that anoxæmia is never present in pulmonary tuberculosis" has lately been criticised by I. Rappaport,[5] who says that cardiac decompensation as the result of anoxæmia is frequent in phthisis and that expectation of life in this disease depends more on the cardiac condition than on the process in the lungs. The symptoms observed in such complications as spontaneous pneumothorax and severe hæmoptysis are intimately associated, he points out, with a breakdown in the cardiorespiratory mechanism due to anoxæmia. The "anoxæmic cardiac syndrome," with its acute dyspnœa, cyanosis, and distress, is preceded by a stage of slowly progressing anoxæmia of which it is a suddenly aggravated manifestation. Left heart failure is the cause. Spontaneous pneumothorax often passes unnoticed in patients with comparatively sound lungs. When the lungs are already the seat of extensive disease with consequent chronic anoxæmia, a further and sudden reduction of oxygen throws an acute strain on the heart; hence the acute distress. Severe pulmonary hæmorrhage is the commonest cause of acute left heart failure due to anoxæmia. Similarly chronic phthisis frequently presents evidence of a chronic anoxæmic cardiac syndrome manifested by dyspnœa and palpitation. Rappaport says that digitalis, by slowing the heart-rate, may prevent the exhaustion of the compensatory mechanism while morphia, a respiratory depressant, can only do harm. The latter is especially contraindicated, in his opinion, when spontaneous pneumothorax has occurred.

THE INFANCY OF MIDWIFERY.

IN surveying the advances of medical science during the last few hundred years it is impossible to avoid the reflection that many of them are a response to the ills brought by civilisation. One is tempted to include obstetrics in this category, for among primitive peoples childbearing is often so easy as hardly to disturb the mother's working life. Travellers in Africa have reported that Nigerian women, making the pilgrimage to Mecca on foot, will step aside into the forest, give birth to a child, and rejoin the column before the tail of it has passed, their baby slung behind them in the slack of their shawl. The Bedouins afford an example which is at first sight contrary. "The nomad hareem," says Doughty, "are delivered as other mothers, with pangs, after a labour of certain hours. It is a fond opinion that the daughters of the desert are as the wild creatures, that suffer not in childbearing."[1] But the life of Bedouin tribes, outside the imaginings of novelists, is mainly one of under-nutrition, of sloth, and herein perhaps lies the explanation. No advantage is apparent for the pains of childbirth unless they were devised as a warning to seek for cover and quiet that the child may be safely born; and such a warning obviously grows less and less valuable as mankind forsakes the savage life for the slack and sedentary existence of Arab tents and European houses. Yet it seems that the pains of labour have developed only as their use from the evolutionary standpoint became negligible, and we are forced to the conclusion that they are not an inherited burden that once had a "survival value," but rather a penalty incurred by woman when she forsook the outdoor life for the home. Thus it is that historians find little development in obstetrics until the days when town life imposed on women a sedentary and presumably unsuitable existence. Dr. D. G. Madill, whose address on this subject to the Dublin University Biological Society appears in the *Irish Journal of Medical Science* for February, says that one of the first inventions to assist labour was the birth-stool, a horseshoe-shaped seat on four legs with a sloping back. This has been employed in all ages among peoples with some civilisation, and is still in use in the Near East. Dr. Madill thinks that this contrivance marks the transition from an active to a passive attitude in the mother, for many primitive tribes employ devices to enable the parturient woman to bring the maximum voluntary pressure to bear. Hadendoa women, in the Eastern Sudan, stand up and grasp the branch of a tree over their heads; among the Shuli negroes, according to Felkin, the mothers sit on a block with their back to a tree and grasp two upright stakes, fitted with footrests about 18 inches from the ground. Dr. Madill traces the beginnings of obstetrical science among cultivators as opposed to nomads, whom he seems to regard as healthy and active. Erylemana, he says, reports that the North American Indians have their own midwives, and many other peoples hand down obstetrical customs from generation to generation. The earliest of these consist of pressure and kneading of the abdomen, but the midwives of the Pueblos and Indian-born Mexicans along the Pacific coast carry out examinations per vaginam. There is very little record of the extent of obstetrical knowledge in ancient civilisations, and the first details that Dr. Madill quotes are from Greece. Plato remarks that two classes of midwives existed, the higher of which were empowered to administer remedies like medical men and to recite certain hymns during the labour. Herophilus, who lived in Alexandria in the fourth and third centuries B.C., knew how to diagnose pregnancy from the condition of the cervix, and how to distinguish fœtal movements; he instructed women in obstetrics in contravention of the Attic Law, and started the movement which ended in its repeal. Nearly all the midwives in Rome were Greeks, and Soranus (A.D. 100) lays down rules for their qualification, but during the later Roman Empire, according to Dr. Madill, midwifery began to evolve some of the principles which apply to-day. Moschion gave exact details for the artificial rupture of the membranes, and directed that the os should be fully dilated at the onset. Midwives of his day assisted the passage of the placenta by attaching a weight to the cord and making the patient sneeze. Soranus, the foremost obstetrician of the old world, knew of the reposition of prolapsed parts, of artificial dilatation and of craniotomy, and Paulus Aeginatus used a uterine speculum. In the Middle Ages obstetrics had definitely become a science, and many of the forceps, cranitomes, and other instruments exhibited in the Wellcome Museum are almost as effective as those used to-day. The municipality of Freiburg, in Germany, employed four salaried midwives in 1485, and Basle had a school of obstetrical instruction in 1498. In conclusion, Dr. Madill mentions the interesting fact that the Cæsarean section, which from being practised in ancient days fell into disuse among the Romans, was revived by the Christian doctrine of the necessity of baptism as the only barrier to eternal damnation. The earliest record of its performance upon a living woman dates, he says, from 1610, so that its use as a means of saving the mother marks a much later period of enlightenment.

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[1] Gillespie, R. D.: An Investigation into the Symptoms and Signs of Fatigue and Exhaustion, Guy's Hosp. Rep., January, 1929, p. 92.

[2] Taranowitsch, L. E.: Biochem. Zeit., 1928, cxciv., 461.

[3] Kühl, G.: Klin. Woch., 1926, v., 1491.

[4] Bast, T. H., Supernaw, J. S., Liebermann, B., and Munro, J.: Amer. Jour. Physiol., 1928, lxxxv., 135.

[5] Amer. Rev. of Tuberc., 1928, xviii., 447.

SUPERSENSITIVENESS TO INSULIN.

INSULIN has been but little used in England except in the treatment of diabetes mellitus, but on the Continent it is employed somewhat extensively in other conditions, notably as a *Mastkur* designed to hasten convalescence and increase weight. W. Falta has shown that at least some forms of obesity are probably the result of over-activity of the islets of Langerhans, and there is no doubt that nutrition may often be rapidly improved by artificially increasing the supply of insulin by means of injections, especially when these are associated with administration of glucose. The response to insulin, as measured by estimations of blood-sugar or by the clinical symptoms, is variable in different subjects and in different conditions. In diabetes associated with high blood pressure, or severe cardiac lesions, there is a definite risk of untoward events if dosage is not watched with great care, and fatal collapse may sometimes be caused by amounts that would provoke no such response in an ordinary diabetic. A remarkable sensitiveness is also sometimes apparent when phthisis complicates diabetes, and this may possibly be due to mild protein shock—to which tuberculous patients are especially susceptible—caused by very slight traces of protein present in the injection. In diseases of the liver, such as cirrhosis, very small doses of insulin may produce hypoglycæmia, a fact which is explicable on the assumption that its administration checks the already defective output of sugar from the liver into the blood. This may also account for the supersensitiveness seen in decompensated cardiac cases in which the hepatic function is seriously deranged. In exophthalmic goitre many attempts have been made to prevent the excessive loss of weight by giving insulin and carbohydrate, and very favourable results upon these lines have been reported. It has been thought that hyperthyroidism tends to lessen the activity of insulin, and a much increased sensitiveness to the drug has often been recorded in myxœdema. The extreme resistance to insulin when toxæmia or sepsis is added to diabetes has been attributed to stimulation of the thyroid by septic products, and the glycosuria often found in exophthalmic goitre—especially when this is of toxic origin—is well known. Much experimental work has shown that the thyroid and pancreas are, in fact, antagonistic, and the practical importance of this has led E. Adler[1] to investigate the sensitiveness of patients suffering from hyperthyroidism to small doses of insulin. He has studied the effect of a subcutaneous injection of 5 units upon the blood-sugar in the fasting condition, and has found no apparent difference between the patients examined and a series of normal subjects; nor could any alteration in sensitiveness be noted in relation to the basal metabolic rate or to the severity of the disease as a whole. No increased sensitiveness was obvious as the patient's condition improved, nor could a parallelism be traced between any one symptom and sensitiveness to insulin. These results may set at rest any fears of undue reaction from the use of insulin in Graves's disease, but unfortunately they throw no light upon the fundamental metabolic disturbances of this disorder. This is further evidence of the unhappy truth that insulin has so far done little to reveal the essential pathology of the endocrine organs.

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[1] Doughty, C. M.: Arabia Deserta. London: 1926 edition, vol. i., p. 239.

[1] Adler, E.: Hyperthyreosen und Insulinempfindlichkeit, Wien. Arch. f. Inn. Med., 1929, xvi., 343.

CANCER AND TUBERCULOSIS.

It has often been suggested that there is an inter-relationship between the incidence of cancer and of tuberculosis. Three years ago Dr. Thomas Cherry, of Melbourne, published in our columns [1] the results of a statistical investigation from which he concluded that the incidence of cancer increased as that of tuberculosis diminished, and only a fortnight ago [2] we were able to summarise some remarkable observations by Prof. Raymond Pearl, who found that an organism suffering from active tuberculosis is less often the seat of malignant disease than an organism suffering from other diseases, and, conversely, that tuberculous lesions rarely occur in persons suffering from malignant disease. Dr. Cherry's work has been carried a stage further by extensive experiment on mice.[3] About 100 animals of a given stock were inoculated intracutaneously with tubercle bacilli in small measured doses. Mice are very resistant to tubercle bacilli and the doses given did not produce active tuberculous lesions. A careful post-mortem examination, both macroscopic and microscopic, was made when the animals died, and the results were compared with the cause of death in about 150 control mice of the same stock. A large percentage of the mice, both in the inoculated and in one of the control series, developed lesions in the lymphoid system, such as enlarged lymph glands, lymphoid infiltration of various organs, an enlarged spleen, or a leukæmic blood picture, in various combinations. These lesions are described in considerable detail, and Dr. Cherry seems to attach a degree of importance to them. A disturbing fact which makes the interpretation of the results difficult is that the incidence of these conditions was as high in one of the control batches which had received raw milk in their diet as it was in the inoculated batches. It was much lower in the second control batch which received boiled milk instead of raw milk, and the difference is very naturally attributed to an infection carried by the raw milk. The author seems to incline to the view that these conditions are manifestations of malignancy. That is a view which is open to doubt. Besides these conditions a number of typical malignant new growths were found and the significant fact is that the number was much higher in the inoculated series than in the controls. In the former group six tumours are described as sarcomata—either spindle-celled or mixed-celled—of which two arose at the point of inoculation while the other four were remote from it (abdomen, hind-foot). If the diagnosis is correct the percentage incidence is an abnormally high one, since sarcomata are rare in mice, and no sarcomata were found in the 100 control mice receiving boiled milk. The incidence of carcinomata is even higher, and cases include not only the usual type of neoplasms in the mouse (carcinoma of the mamma and of the leg) but also such unusual examples as carcinomas of the pancreas and of the colon. Although the true malignant nature of some of the tumours does not seem to be fully established either by the description or by the figures accompanying the paper, the experimental evidence submitted establishes a strong case in support of the contention that the experimental inoculation raised the frequency of spontaneous malignant new growths. Dr. Cherry states very clearly that he does not interpret his results as demonstrating a direct specific causal nexus between the tubercle bacillus and malignancy. The relationship is an indirect one. The tubercle bacillus is only one of the many carcinogenic agents such as tar, X rays, Fibiger's spiroptera, which, though very diverse in their nature, induce by their continued action the condition of malignancy. The period of induction with these various agencies is very long and this seems to hold good also for the true neoplasms arising in the inoculated mice, although the data are not always clearly given.

The results of this careful and laborious investigation require confirmation, for the validity of Dr. Cherry's contention depends on his pathological diagnosis of the truly malignant nature of the tumours which developed in his experimental animals. On this point we feel that he has weakened rather than strengthened his case by including conditions of doubtful malignancy.

GALLOP RHYTHM.

The *bruit de galop* and the corresponding phenomena which can be recognised on palpation have long been regarded by clinicians as signs of ill-omen, and the theories which have been put forward about the mechanism of their production are many and varied. These signs are most often found in cases of chronic nephritis with high blood pressure, and their appearance is generally taken to signify that the heart is failing. Two types of gallop rhythm have been described, the distinction between them depending on whether the additional sound occurs early or late in diastole. In the one case the second, and in the other the first heart sound appears to be reduplicated. Most writers who have attempted to probe the mystery of this peculiar sign have taken as their guide a tracing of the cardiac impulse; but owing to its variability the cardiogram has proved little better than a broken reed to those who have leant upon it. A safer clue has been followed up by H. Mond and E. T. Oppenheimer,[1] who have made a series of synchronous records of the heart sounds and electrocardiograms. Their records show that the supernumerary heart sound of gallop rhythm always corresponds in time to auricular systole, and they point out that it disappears when the auricles fibrillate. Its position in the cardiac cycle may be early, mid, or late diastole. When the heart is beating rapidly diastole is short and the contraction of the auricle, with its accompanying gallop sound, follows close on the heels of ventricular systole. During bradycardia, on the other hand, there is a long silent interval between the second heart sound which marks the end of ventricular systole and the succeeding auricular cycle. Under these circumstances the gallop is presystolic in time. And, lastly, when bradycardia is associated with delayed conduction, auricular systole and the third heart sound may occur in mid-diastole. Mond and Oppenheimer believe that the lax walls of the empty ventricle normally damp out the sounds produced by auricular systole, but that in the failing heart, when the diastolic tension of the ventricular wall is increased, the acoustic conditions are completely changed. The ventricle then behaves as a resonator and amplifies the sounds produced by the contracting auricle. This hypothesis is certainly attractive. It affords an explanation of the association between gallop rhythm and congestive heart failure in cases of high blood pressure, and harmonises with the other known facts.

PATHOLOGY OF PYORRHŒA ALVEOLARIS.

An addition of considerable value has been made to our knowledge of the morbid anatomy of pyorrhœa alveolaris by the work of Mr. Warwick James and Mr. A. Counsell [2] carried out in the Bland-Sutton Institute of Pathology at the Middlesex Hospital. The earliest changes occur in the subgingival epithelium of the gum, just below its junction with the periodontal membrane of the tooth which thickens and sends out finger-like processes into the corium. As the condition advances the epithelium grows downwards along the cement of the root and becomes attached to the latter by means of a layer of keratinised material. This is in accordance with the findings of other observers, notably H. Box and B. Gottlieb. Associated with these proliferative changes there is desquamation of the superficial epithelium in the direction of the root, forming a pocket which tends to deepen and widen. The downgrowth of epithelium along the root of the tooth is, however, in advance of the destruction, so that ulceration does not occur. So far from the pocket being lined with granulation tissue, as has been frequently stated, it is always covered by epithelium which being of new formation differs from that normally lining the gingival trough. As may be seen in carefully prepared sections, tartar is deposited upon the keratinised epithelium adherent to the cement and fills the pocket. It would appear that the lesions usually commence between the teeth and thence extend laterally. The circular ligament, which is the name given to the junction of the gum corium with the periodontal membrane, is destroyed but is reformed at a lower level concurrently with the extension of the lesions in the epithelium; its fibres, however, are less regularly arranged than in the normal state. In advanced cases the fibrous tissue may be replaced by a cellular infiltration of the plasma type and much of the support of the tooth is lost. Definite changes appear in the blood-vessels, the walls of the arteries being thickened and the veins dilated. The cytological changes are instructive. In the early stages of the disease there is an infiltration of lymphocytes into the subgingival epithelium which remains localised. In later stages plasma cells are present round the vessels; thence they extend in diffuse masses along the perivascular channels into the medullary cavities of the bone leading to the destruction of the latter tissue. In this way there is a direct path of infection from the gum margin to the interior of the bone—a point of some importance in its bearing on the problem of focal infection. There has been a tendency to assume that the open sepsis of pyorrhœa which discharges its toxins into the mouth is relatively less serious than the closed type of apical infection in which the only escape of toxins is into the blood stream. It is doubtful if this distinction holds good, for while some of the toxins in pyorrhœa may pass into the mouth and be swallowed, yet there appears to be an abundant opportunity for infected matter to be absorbed into the blood stream by means of the vessels in the alveolar bone. Polymorphonuclear leucocytes are relatively uncommon; when present they would seem to be due to a pyogenic infection superimposed on the original lesion. In spite of the implication of the word pyorrhœa the presence of pus is uncommon.

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[1] THE LANCET, 1925, ii., 644.

[2] Ibid., March 23rd, 1929, p. 632.

[3] Med. Jour. Australia, Feb. 9th, 1929, p. 160.

[1] Arch. Internal Med., February, 1929, p. 166.

[2] Histological Investigation into "So-called Pyorrhœa Alveolaris," Brit. Dent. Jour., 1927, xlviii., 1237; The Primary Lesion in So-called Pyorrhœa, Ibid., 1928, xlix.

While it has usually been thought that the lesions in the periodontal membrane were of great importance, James and Counsell find that this structure is the last to be involved. They describe histological changes in the membrane which resemble those described by Box under the name of "rarefying pericementitis fibrosa." The bony changes consist of a progressive marginal absorption of the lacunar variety. Loss by halisteresis as described by N. Znamensky was not observed. Where the loss of bone has opened up the medullary cavities the bone-marrow undergoes changes and in due course becomes replaced by fine fibrillar connective tissue and plasma cells. The chief points of interest which emerge from these investigations are that pyorrhœa is essentially a gingivitis in its early stage, which is characterised by epithelial proliferation along the root, leading to the formation of a pocket which is always lined with epithelium. There is a progressive destruction of bone accompanied by fibrotic changes in the gum corium. The periodontal membrane is the last tissue to be attacked so that the disease is incorrectly termed a general periodontitis. The presence of pus is uncommon and when it exists is due to a secondary pyogenic infection. An infiltration with plasma cells is a constant feature and plays an important part in the spread of the disease. The various changes described are illustrated by a remarkable series of microphotographs and add much to the value of the papers.

OCCUPATIONAL SILICOSIS.

SILICOSIS is now receiving more attention than any other occupational disease, its prevalence having been grasped almost suddenly. Allied with tuberculosis it forms the most fatal and most preventable group of phthisis cases, and its occupational origin is being recognised in the granting of compensation to the victims. During the last 12 months the provisions of the Compensation Act in this respect have been extended to the grinding of metals, to the potteries, to tin-mining, to various other industries in which there is a silica dust risk, and now since April 1st to the sandstone industry. Without doubt through claims arising and medical supervision of those employed, more accurate and valuable information on the incidence of the disease will become available. Similar action is being taken in the Dominions—on the Rand, in Ontario, in New South Wales, and in Western Australia. European continental countries have so far held back, but the subject has had the premier place this week at Lyons in the International Congress on Occupational Diseases. The United States, too, are fully alive to the new knowledge; and a valuable report of a special committee has just been issued[1] on the silica hazard of men employed in building and tunnelling the Manhatton schist upon which New York is built. Over 200 men taken from work were carefully examined, with X rays and otherwise, and 57 per cent. of them showed signs of silicosis, 15 per cent. being in a fairly advanced stage. This certainly seems to justify the conclusion that silicosis is a serious hazard to rock drillers, blasters, and excavators in New York City. Study of the dust showed that both in silica content and in number and size of particles it was dangerous to health; the free silica content was from 1 per cent. to 84 per cent., and sampling showed the amount in the air generated by the pneumatic drills to be of the same order as is found in metalliferous mining. The committee have good ground for recommending that compensation should be granted by law for disability due to silicosis. Such an economic liability is bound to incite preventive measures. Simultaneously there reach us from New South Wales two Government studies, one into dust sampling in sandstone industries,[2] the other into pneumonokonioses produced by diverse mineral dusts.[3] Building on and with, and tunnelling through, sandstone at Sydney presents a problem similar to that of New York. The stone is composed of 86 to 95 per cent. quartz grains, and, when worked with machine drills, gives off a plentiful supply of fine injurious dust. The dust studies, in which the Owens's jet dust counter and the Greenburg-Smith impinger were used, are of great interest. They indicate that if each dust particle initiates a fibrotic condition, the 1-micron particle is the most dangerous, because it is in majority; if fibrosis depends on solubility of dust particles in the lungs, the 2-micron is the most pernicious, as it exposes the greatest percentage of surface; whilst, if quantity is the most important factor, the 3-micron is most pernicious, as it is heaviest. If number, surface, and weight are all factors, then sizes 1–3 are the worst. Of not less interest is the study in which from exposure to dust of orthobase basalt, of certain coals, of oxide of iron, of asbestos, and of cement, evidence is adduced to prove the production of a fine type of pulmonary fibrosis, as distinct from silicosis. People with this type of fibrosis do not seem to be especially liable to tuberculosis, although other pulmonary diseases concern them. A whole new group of pulmonary fibroses is here under observation.

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[1] Jour. Indust. Hyg., Feb., 1929, p. 37.

[2] Study in Industrial Hygiene, No. 12, Report of Dir.-Gen. of Public Health, New South Wales, for 1927. Sydney, 1929.

[3] Study No. 13.: Ibid.

BLOOD PRESSURE AND DISEASE.

ALMOST every medical discussion nowadays shows the reversion of medical thought towards diatheses and types of constitution. The one on blood pressure at the Hunterian Society on March 25th proved no exception. Dr. Halls Dally, the opener, while enunciating his belief that the problem could only be rationalised from the biological standpoint, nevertheless ventured to lay down a certain standard of blood pressure in relation to age. Physiologically, he said, the physician might expect to find a blood pressure of 80/50 in a child of 5, of 100/50 in a child of 10, and a sharp rise with the onset of gonadal function at puberty to 120/75, while between the ages of 17 and 40 a man might be expected to show a reading of 125/80, and a woman of 115/75, both sexes rising slowly up to 135/88 at the age of 60. For venturing to give even this rough guide, however, Dr. Halls Dally was severely criticised by subsequent speakers. Dr. Campbell McClure declared that he had no interest whatever in an "average" blood pressure. Dr. Temple Gray averred that no statement had done more harm in medicine than the dictum, "A man is as old as his arteries." Some men would live to a ripe old age with arteries in an apparently hopeless condition; others would die young with apparently healthy vessels. He had seen men very ill with nephritis with a blood pressure of 85, and had known a man walking about with a blood pressure of 300. Dr. Temple Gray also pointed out that Kretschmer's four psycho-physiological types showed distinct differences in their blood-pressure levels, and Dr. McClure drew a vivid picture of the two constitutions, the high and low blood-pressure types. The person of the low-pressure type was an unsatisfactory child at school. He might have artistic talent, but he could not shine at intellectual work. He suffered from lassitude, headaches, insomnia, and evening fatigue. He was seen by the doctor in early manhood, but seldom when he was over 50. Slow to develop, he was rarely able to put his abilities on the market before he was 40, but by the time he was 60 he had far outdistanced his high blood-pressure rival, who had shot ahead at school with exuberant vitality, carried off all the prizes in his early professional career, and died intellectually at 38. The high-pressure type came to the doctor much later in life, and suffered from many disorders of cardiac and renal function to which the low-pressure man was a stranger. The latter has, Dr. McClure thought, to beware chiefly of early cancer, which is apt to hit him before he has time to react to the environment of ageing. There is a certain structural difference between the two types which is revealed in the shape of the heart. The low blood pressure type has a tubular heart, is always short of calcium, and is liable to tuberculosis; the high blood pressure type has the "bullock-heart," is always full of calcium, and has difficulty in elimination. If he contracts tuberculosis, he recovers. Dr. Halls Dally pointed out the peculiar resemblance between the symptoms of high and low blood pressure, and described them as expressions of two opposite forms of failure to adapt to the environment. Nevertheless, there must always remain a certain number of patients in whom abnormal blood pressure, as a direct measure of the load the heart and valves have to bear, and of the vasomotor tone, calls for therapeutic measures. The decision to treat should never be based on simple systolic readings alone. The diastolic, the differential, and probably in future the arteriolar and capillary pressures, will all prove of great significance.

WE regret to announce the death on April 1st, at Hove, of Dr. Robert Lauder Mackenzie Wallis, lecturer in chemical pathology at the University of London, and formerly chemical pathologist at St. Bartholomew's Hospital. He was in his forty-fourth year.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCXCI.—THE TREATMENT OF VULVAR AND ANAL ECZEMA.

PART II.*

X Ray Treatment.

IN the past it has often been claimed that X rays are the best treatment for these cases of pruritus and eczema of the ano-genital region. X ray treatment used to be my chief therapeutic agent, but now I regard it as no more than an aid. I would thus summarise my conclusions:—

1. When treating a severe, chronic case one correct dose of X ray is of great value, often causing a marked step forward in the progress whilst other treatment is continued.

2. After trial of many doses, I have found that the method which has given most satisfactory results is one dose, given thus: H.2 unfiltered, and H.2 or H.3 filtered through ½ mm. aluminium. The pastille is placed on the skin. I use the Hampson tintometer and Sabouraud pastilles obtained from Paris.

3. X rays do not alone bring about a cure.

4. X rays are probably unnecessary for mild non-œdematous cases; these often respond to simpler measures.

5. One full pastille dose of X ray, even if filtered through ½ mm. aluminium, can be followed by telangiectases. With the milder tubes of pre-war years these did not appear for several years. Nowadays, with the higher voltages employed, the same dose is soon followed by pigmentation and often by telangiectases within a year.

6. When relapse has occurred, even if long after several small doses of X rays had been given at intervals, the administration of one suitable dose does not cause the usual benefit. This resistance to repeated X ray dosage has been noted by many observers in the case of rodent ulcer and other dermatoses.

The following case shows how little X rays alone can do for a severe form of this malady:—

Mrs. P., aged 34, in June, 1919, had tried many remedies and had been under the care of two dermatologists for fissured and œdematous eczema of the vulva and anus. She had become a tearful wreck from lack of sleep. She was given the usual calamine with carbolic lotions, and mercurial and cocaine ointments. Just under one pastille dose of X ray was administered by the method above described. As the nervous system was so undermined she could not be expected to refrain from scratching, and hence it was impossible to treat her whilst at work. She was put to bed; all the diseased region was painted with pure carbolic acid. This was followed by fomentations with 1 in 40 carbolic, changed every two or three hours. The parts were kept thus so raw and sore that she could not scratch, and the habit was broken whilst sleep was obtained. When the outer layer of mucous membrane and skin had healed she had carron oil, calamine cream, and daily high-frequency treatment to both vulva and anus. Then the vaginal discharge was dealt with. When she was seen after the August holiday she was almost well. In September a 2/3 divided X ray dose was given. She became completely cured and had remained without the slightest relapse when I heard from her in 1926.

High Frequency.

Again one must take into account the difference of modern instruments and those of former days. Low tension diathermy is used to-day. In pre-war days the vacuum tubes were attached to the Oudin resonator of the high voltage high-frequency machine. The tubes of the older machine convey an entirely different sensation to the patient; they are less warm, but more stinging; moreover, especially when combined with the condenser couch, they aid the general health of the patient. When I speak of high-frequency vacuum electrodes I mean the tonic dose obtained from a Dean instrument with noisy spark gap in glass container, manufactured in 1906. From time to time all wiring has been replaced, and the Leyden jars have given place to condenser plates in oil. No diathermy tube which I have tried conveys anything like the brilliant invigorating sensation of the older instrument. Treatment by the vacuum tube is especially indicated when there is much swelling; this is appreciably reduced during the sitting of 15 to 20 minutes. I use a tube specially made, large enough to fit over the entire vulva. This is pressed upon the part and held in close contact; it is applied daily for 6 to 12 days. Many a patient whose suffering was so great that no local application alleviated the irritation enough to prevent uncontrollable night scratching has remarked that improvement dated from the first application of the high-frequency tube. The general tonic effect is also most helpful in neurasthenic and toxæmic cases.

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* Part I. appeared last week.

Miss A., aged 59, seen in 1925 with extensive eczema of the vulva and anus. There was a slight vaginal discharge. She had suffered for 15 years and tried many remedies. She made great improvement within a week after one X ray and light twice a week, and the usual mercurial ointment and protective care. But she spontaneously remarked that the first great relief from irritation followed the first high-frequency application. She was practically cured within five weeks and remained so when I last heard in 1927.

Ionisation.

In some cases I have given zinc ionisation. Fissures are cured by 1 or 2 m.a. for 4–8 minutes. When ionisation is given over a larger area it has the drawback that the initial increase of irritation causes patients to lose confidence. The value of ionisation to the cervix with zinc or copper has at long last been recognised as a most beneficial method of treatment of discharge. A relapse of pruritus and eczema is often found to be due to a renewed discharge.

Miss N., aged 44, seen in May, 1913, had had severe vulvar eczema for six years. She was put to bed and the parts painted with pure carbolic acid. In these days I had not realised the causal importance of a slight vaginal discharge. For the time she was cured but relapsed in July and again in September. Then at last I treated the discharge, giving copper and zinc ionisation to the cervix. She became cured and remained so when I last heard from her in 1926, when she came to see me.

Ultra-violet Light.

Of recent years this method of treatment has received enthusiastic supporters. Details of the types of case treated are singularly lacking in most of the published reports. What other form of treatment is employed—ointments, lotions, powders, protective or general hygiene—is scarcely if ever mentioned by those who acclaim the value of ultraviolet light as a panacea for this distressing malady. I tried the tungsten arc and the mercury-vapour lamp, and have formed the opinion that ultra-violet light is certainly a useful adjunct to other treatment; I have never relied upon it alone. It seems more beneficial in treatment of the vulva than of the anus, but it has not been in use long enough to compare its value with other methods. Many patients have remarked that the tungsten arc was more beneficial than the mercury-vapour lamp. I became convinced of the value of true sunlight by its effect on two women who could not stay in London long enough to have more than a few days' preliminary treatment. Both had profuse muco-purulent discharge from the womb, so irritating that the entrance of the vagina, as well as the labiæ, was swollen and tender. The usual X ray dose was given, ionisation to the cervix, and careful directions as to douching and guarding the infected areas from the discharge. The patients went, one to the Riviera, one to the South of England. They exposed the parts to the direct rays of the cool morning sun for half to one hour respectively. Both became cured and both attributed high value to the sunshine.

A word of caution must here be given concerning the application of X ray and ultra-violet light on the same day. If as much as 4/5 of a pastille, even if filtered for half time, is followed by tungsten arc, concentrated, 1 minute at 12 inches, acute erythema and swelling follow. This is intensely irritating and painful for over a week and alarms the patient. On the other hand, it brings about a rapid cure. I learned the danger of X ray and ultra-violet at the same sitting by my experience with four cases. I had treated an extensive eczema in a diabetic patient by this method, hoping to hasten matters before I left for a holiday. Later, she told me she had suffered greatly, but the subsequent cure had been miraculous in its rapidity and completeness. Three other severe cases reported similarly. Two were so grateful that they did not mind the early reaction; the other, however, never forgave the suffering; so I have not dared to repeat this method.

Local Applications.

The recommended creams, ointments, and lotions are legion. For times of urgency, when irritation is unbearable, menthol (grs. iv.—℥i.) relieves, but gives rise to much pain when cracks are present. Cocaine 2 per cent., or butyn 5 per cent., in lotion or cream, are very useful; so also are 1 or 2 per cent. solutions of creolin or carbolic acid. Some find a saturated solution of boric acid the best application. It comforts the patient to be warned of the fact that different applications suit at different stages of the disease, even at different times of the day; so changes must be rung. When the patient can go to bed and have the advantage of skilled nursing, many now rely upon coal-tar. When there is thickened leathery induration and the patient can lie up, painting with pure carbolic acid, followed by compresses of 1 in 40 carbolic, soon causes exfoliation. Diathermy sparking brings about the same effect. The mucous membrane is then protected by some soothing cream, or carron oil will answer when the mildest powder in a cream causes discomfort. Many patients cannot lie up for longer than a few days. The mercurial preparations answer in most cases: hyd. ox. flav. gr. i. to ℥i. of paraff. moll., calomel grs. xx., zinc oxide ʒi., paraff. moll. ℥i. Lassar's paste, or a calamine cream with 1 per cent. carbolic acid, suits others better. When the parts are no longer swollen and cracked, a dry dusting powder, equal parts of talc, bismuth oxychloride, and zinc oxide, with a little boric acid, is an excellent application for use by day.

Before 1910 very little was done for these cases except the application of cocaine ointment 2 per cent., and painting weekly with silver nitrate grs. xvi. in spt. etheris nitrosi ℥i. As a result of ignorance of the origin of the eruption, no care used to be taken to remove sources of infection of the skin and mucous membrane. The urine, we used to be taught, was a bland fluid which could not irritate the skin. Again, all women were supposed to have, from time to time, more or less vaginal discharge; hence one of the chief sources of infection of the vulva was not dealt with. Patients used to be told, even by dermatologists, that the condition was incurable, or "a neurosis"; and only palliative treatment was given, consisting for the most part of cocaine, silver nitrate, mild tar, or mercurial ointments and bathing with boric lotion. All of these are valuable, and are still used to-day.

A Few Failures.

It is always instructive to consider one's failures. Before the war, undoubtedly many relapses of my cases of vulvar eczema were caused by unrecognised slight vaginal discharge. Many of the relapses of pruritus and eczema ani, as I have already said, were due, I at last realised, to paraffin leakage. Again and again, when such patients came to me with a relapse, I would find tinges of fæcal matter between the anal ridges. Other unrecognised causes of relapse were possibly due to the fungus described by Castellani.

Notes of two cases of comparative failure are given below:—

Miss J., aged 47, who said she had had eczema on and off all her life, was first seen in May, 1917, with severe eczema of anus and vulva. She was a delicate woman of the thin, sallow, nervous type. She had had six X ray weekly doses from a physician skilled in X ray treatment, but had not received the slightest benefit. Her case provided another proof that X ray is only an adjunct to the correct management of these cases, and cannot alone cure the condition. At that time I relied on a mild antiseptic ointment, and the dosage of X ray I had found to be most efficacious. The result was successful at first, in spite of the fact that previous X ray dosage told against a good prognosis. But she relapsed in 1919; and again in 1922, though not severely. She was only able to stay in London a day or two at a time, and so no continuous observation or treatment was possible. Eventually she wrote she was greatly improved but subject to a mild degree of periodical recurrence of her old trouble. This case failed because of the obstinacy of a condition which had had too many doses of X ray and because of the defective diet and lack of exercise taken by an impoverished and unoccupied woman with few interests in life.

Miss S., aged 45, was sent to me last year with vulvar eczema dating from the age of 17. She was of poor mentality and physique, with a lengthy history of illnesses—including Graves's disease and colitis. Again and again in this case, just when success seemed assured, the parts would swell up and progress would be retarded for many weeks. At length her companion told me that although scratching was denied, in reality the sufferer often indulged in a truly alarming orgy of it. After trying everything, she was sent to hospital where the surgeon excised the parts. This failure was due to time in a home being limited, owing to financial reasons, and also to the fact that it was impossible to break off her habit of scratching.

Examples of Successful Cases.

Two difficult successful cases, illustrative of types in which the disease was due to different causes, may also be of interest.

In 1918 I saw Miss E., one of the most widespread cases I have ever seen in a young woman of 28. She had become very neurotic from lack of sleep, due to the incessant irritation and worry which had existed despite a variety of treatment and the doctors for over three years. Both vulva and anus were swollen and eczematous. There was a prolonged history of constipation, and apparently she had suffered from true colitis some years previously. No doubt the mucus which exudes in these cases had infected the skin with streptococci and started the chronic eczema. She caused me much anxiety, as in her sleepless nervous state it was exceedingly difficult to make her abstain from scratching. Indeed, the sole successful method was the application of a stinging lotion containing menthol and spirit, which caused soreness long enough to break the habit. *Sleeping draughts carried her over the early days until* the X ray and daily high-frequency applications reduced the irritation enough for her to be able to coöperate loyally in the progress towards the cure which occurred after two months. When I heard from her four years later she had had no recurrence.

Mrs. T., aged 56, first seen in March, 1926, had suffered from pruritus and eczema of vulva and anus on and off since the menopause. All the time she had had treatment of all kinds, local and general, from several most careful physicians. In autumn, 1924, she had had 6 ¼ pastille doses filtered through 1 mm. aluminium. In spring, 1925, she had had 10 almost weekly doses of X ray 1/3 and ¼ pastille, three not filtered, the others filtered through ½ and 1 mm. aluminium. The patient was athyroidic, with blue upper arms and breasts, and much abdominal distension. When she was sent to me, she had a severe recurrence of eczema, extending to anus and intergluteal fold. The only causal history I could obtain was that two years previously she had noted intense irritation coincided with vaginal discharge. This led me to decide to treat the uterine discharge. A course of ionisation treatment to the cervix was begun. At the same time, as the vaginal discharge seemed insufficient to cause such widespread eczema, a catheter specimen was taken and revealed numerous coli and streptococci, from which an autogenous vaccine was prepared and given. Less than my usual dose of X rays was given to the vulva, anus, and intergluteal fold. The mercury-vapour ultra-violet light was given twice, then thrice a week, to the whole region; 2 feet distance for two, then three minutes—eight doses in all. High frequency, nine doses of 15 minutes were given to the vulva daily. Thyroid, pituitary, and a diet were ordered. Every soothing cream I could prescribe, as well as the usual protective ointment for the vulva, and coal-tar for the anus, was tried; of all these the patient preferred lipol. As she was seen daily, changes in treatment were made according to the daily indications. Within a month all the affected parts looked normal. The vaccine was carried on after she left London. When she ceased vaccine in September, pruritus began, and on resumption of vaccine it ceased. I therefore advised her to carry on with vaccine for a year. The local trouble remained cured and a much higher level of general health was maintained. She attributed the lasting results to the vaccine. I attributed much of the success to the improvement of the general health with thyroid and corrected diet.

Principles Guiding Local Treatment.

When called upon to treat a case of vulvar eczema the practitioner should pass in review all the causes, and remember that more than one may be in operation. The principles guiding the local treatment are those employed for all skin diseases. Soothing remedies are indicated where there is hyperæmia and acute inflammation, stimulating remedies when the condition has become chronic, exfoliating applications in late stages of induration. When only hyperæmia is seen, as in the early stage of a colon bacillus infection arising from external sources, it is surprising how often it will yield to simple boric ointment. In all acute conditions, calamine lotion or cream is a justly popular soothing remedy. It is important to use only the best powders; I have often found a calamine lotion contain so much gritty material that it was not a soothing, but a very irritating application. When *the inflamed parts show moist exudation*, Lassar's paste (zinci oxidi, amyli, āā ʒi.–ʒii., paraff. moll. ℥i.), without salicylic acid, answers well; when there is dry induration of long standing, the mild mercurial or tar ointments do best. Pure carbolic acid, strong salicylic acid, or diathermy sparking will cause exfoliation; soothing remedies are then applied to the fresh membrane beneath. X ray treatment is indicated only in chronic conditions, especially if the patient can be seen but seldom. The full effect of the dose is not gauged until about ten days have elapsed; the patient should be warned of this fact. When the patient can be seen frequently other methods should be tried before resort to X rays. High frequency is especially indicated when there is much swelling, in both acute and chronic cases. The small portable apparatus is not without value when the large instrument is not available. The correct technique for the best use of ultra-violet light is not yet known. A strong dose is excellent; but the patient should be told that this involves pain and staying in bed. The slower methods hasten cure, especially when pigmentation occurs. Direct sunlight in our climate is rarely too strong, and still more rarely is it available for many days in succession; the practitioner need not fear to order exposures of half to one hour daily for one or two weeks.

General treatment is of the utmost importance when the urine contains sugar or micro-organisms. It can often be foretold, from the aspect of a patient, that a catheter specimen will reveal the presence of colon bacilli, streptococci, or both. In young women the pulse is rapid, the heart often dilated; in older women there is frequently evidence of defective thyroid and pituitary action. Colon bacillus infections are prone to relapse, largely because the patients will not persevere with the local protective measures necessary to prevent reinfection. When colon bacilli and streptococci are found in the urine vaccines play a prominent part in treatment. With sensitive, delicate women, who have a rapid pulse, it is important to avoid reactions. Overdosage prolongs their illness; hence the initial doses must be small, say 50,000, with cautious increase up to 1,000,000. Both streptococcal and colon bacillus vaccines are helpful in extensive eczema starting from the anus, for they aid the general resistance of the patient, and no measure which achieves this can be omitted. At the menopause, and at any time when there is evidence of deficient endocrine activity, the correcting gland should be administered. In the near future the biochemist will explain to us why calcium lactate is so often useful in these cases.

AGNES SAVILL, M.D. Glasg., M.R.C.P. Irel.,
Physician to the London Skin Hospital.

Special Articles.

THE ALLEGED TOXIC ACTION OF ACCESSORY FOOD FACTORS.

BY J. CLIFFORD HOYLE, M.B., B.S.,
ERNEST HART MEMORIAL SCHOLAR.

(From the Pharmacological Laboratory, Cambridge.)

VITAMINS, or accessory food substances, in relatively minute amounts are essential constituents of the perfect food. As it is now customary to administer these substances in quantities out of all proportion to those found in natural foods, it is of some importance to inquire how far, if at all, these excessive amounts are objectionable.

Hopkins[1] in 1923 first suggested that a balance of vitamins in the diet might be an important factor in the maintenance of normal health. He found that rats failed to grow when an excess of cod-liver oil was given in addition to the normal diet, but that this event could be prevented by administering an excess of vitamin B, as marmite. Evidence was not available at that time to show whether vitamin A, vitamin D, or some other constituent of cod-liver oil was the factor responsible for the disturbance of health. Takahashi[2] [3] had previously claimed that a purified extract of vitamin A administered to rats in excessive amount caused cessation of growth and later death; but Drummond[4] refuted this statement and showed that no harmful results followed the administration of large amounts of active preparations. Magliano[5] also found no detrimental effects to growing animals from large doses of vitamin A.

It is evident from these results that no reason at present exists to prove that excess of vitamin A was the poisonous factor in the observations made by Hopkins with cod-liver oil. Mouriquand and Michel[6] in guinea-pigs and Bezssonoff in clinical cases[7] found that large doses of cod-liver oil were detrimental in scurvy. Euler and Widell[8] claimed that an excess of cod-liver oil gave rise to faulty growth and bone formation in rats, but that this was prevented by increasing the allowance of vitamin C. Arvay[9] and Agduhr[10] have recently reported degenerative changes in the myocardium of rats fed with excess cod-liver oil, but Höjer[11] criticised the latter's results on the ground that an inadequate amount of vitamin B complex had been given. Hartwell[12] and Sure[13] found that an excess of cod-liver oil given in addition to a normal diet resulted in failure of growth and gestation in female rats. This has been confirmed by Harris and Moore,[14] who have shown that if the allowance of vitamin B complex, given as marmite extract, is increased from about 6 to 12 per cent. growth proceeds fairly normally but gestation is still rare, and when it occurs usually terminates abnormally. They found also that when an excess of the unsaponifiable material of cod-liver oil was given with a diet in which vitamin B complex was absent the rats lost weight more rapidly and suffered from skin lesions simulating those of pellagra.

Interpretation of Experimental Observations.

It is obvious that the interpretation of such experiments is at present a matter for conjecture; they are often regarded as examples of defective vitamin balance though without valid evidence. In no case has it been possible to administer a reasonably pure preparation of the vitamins tested, and until this can be done it must remain questionable whether the changes established are not the result of some toxic factor other than that of deficient vitamin balance. The position at present is that although considerable evidence exists to show that an excess of cod-liver oil is definitely harmful in animal experiments, and some to suggest that when increased marmite is given at the same time the effects may be modified, we have no reason to suppose that such changes are due to the vitamin content of the oil.

Since the discovery by Rosenheim and Webster[15] that irradiated ergosterol is the parent substance of vitamin D, it has been possible to administer this vitamin in far larger doses and in a purer form than has been the case up to now for any other accessory food factor; and already many observations have been recorded showing the effects of large doses in animals taking otherwise normal diets. Pfannenstiel[16] found that grossly excessive amounts resulted in the death of young rabbits. Kreitmair and Moll[17] extended this work and found that mice, rats, cats, rabbits, dogs, and guinea-pigs were killed in periods ranging from 15 to 40 days with doses varying from 1 to 40 milligrammes daily. In all cases the animals lost weight profoundly, and at post-mortem examination the spleens were atrophic and the small intestines showed hæmorrhagic enteritis. But the most striking lesions were found in the vascular system, in which an extensive arteriosclerosis, involving the aorta and other main arteries, was present. In most of these lesions considerable deposition of calcium salts occurred, and this was a feature also in the lungs, kidneys, and intercostal muscles. In most cases this was accompanied by a secondary sclerosis. Kreitmair and Hintzelmann[18] have since confirmed this, and described in detail the pathological changes found; and Harris and Moore[14] have noted that death may occur in rats though they describe no post-mortem changes.

There is thus a considerable body of evidence to show that irradiated ergosterol when administered to animals in large amounts possesses highly toxic properties. The German workers considered that these changes constituted a "hypervitaminosis." Dixon and Hoyle[19] failed to confirm these results; when a few mg. were given daily to rats no changes were found. On the other hand, when the irradiated ergosterol varied from 11 to 18 mg. daily in a diet otherwise normal the animals failed to grow, and at post-mortem examination urinary calculi were found; but lethal effects and the changes described by the German workers were consistently absent. Klein has also failed to confirm the lethal effects in a recent investigation.[20]

The Method of Irradiation of Ergosterol.

In view of these contradictory results with preparations of irradiated ergosterol of similar antirachitic potency, Dixon and Hoyle suggested that another factor might be at work producing direct toxic action. They emphasised that the method of irradiation might well be a crucial factor in this connexion. The ergosterol used in their experiments was irradiated in solution in oil and in the absence of oxygen. The German workers did not state their method of irradiation, but in the experiments of Harris and Moore, in which corresponding lethal effects were found, the irradiation was carried out in alcoholic solution. It may well be that when irradiated in this way ergosterol forms some toxic by-product in addition to vitamin D, whereas when the irradiation is effected in an oily medium, as occurs in nature in the epidermis, this does not occur.

The position on this question is at present, therefore, open, though it is obvious that it is important. If the suggestion made by Dixon and Hoyle is substantiated then ergosterol for commercial use must be irradiated in oily solution. In this country this already obtains, but abroad an alcoholic or ethereal solution is largely employed. It is true that the toxic doses in animal experiments are exceedingly high compared with the therapeutic doses, but it should be remembered that these experiments have been made only on normal animals, and it is not known how far this ratio applies in initial vitamin deficiencies or other nutritional disturbances.

Calcium Deposition.

If the position of the German workers is confirmed and their results are in fact a true "hypervitaminosis" then a considerable addition to our knowledge of the ætiology of experimental arteriosclerosis will have been made. For it is generally believed at present that two stages occur in the production of this condition—an initial injury, mechanical or toxic, to some part of the vessel wall, and later compensatory proliferative changes and sclerosis, with calcification of the dead tissue at the same time. If this conception is upheld either vitamin D must be sufficiently toxic in large doses to injure the vessel wall directly, or it must be assumed that the injury is brought about by primary calcium deposition in the vessel wall, the result of an excessive mobilisation by the vitamin. If the former hypothesis were true it would constitute the first known instance of a physiological substance producing an effect in excessive amounts that is unrelated to its normal action; if the second hypothesis were true, then it is evident that arterial lesions, due to primary calcium deposition in the vessel walls, would be expected in all conditions associated with excessive calcium mobilisation.

In clinical arteriosclerosis there is no evidence to suggest that excessive calcium mobilisation is a factor in the production of the injury to the vessel wall; the blood calcium has only been recorded in essential hypertension but here it is normal.[21] and in the earliest lesions calcium deposition is not found. Calcium deposition is essentially a secondary phenomenon. On the other hand, it is known that widespread "metastatic" calcification occurs in conditions where a pronounced degree of bone resorption is taking place, such as in osteosarcoma, osteomalacia,[22] and osteitis fibrosa.[23] In these diseases the blood calcium is usually higher than normal [24-26]; and in many, if not all, cases of osteomalacia and osteitis fibrosa parathyroid tumours or hyperplasia occur.[27-33 etc.] Recent work [34-36] has shown that the parathyroid hormone raises the blood calcium by mobilising calcium from the soft tissues and ultimately the bones. This strongly suggests that in the diseases mentioned the bone resorption and raised blood calcium level are due directly to increased functional activity of the parathyroid glands. In such cases there is no evidence of any preceding injury to the tissues and the metastatic calcification may depend entirely upon the increase in blood calcium. This view of the part played by the parathyroid glands in these conditions is supported by the work of Hueper,[37] who found extensive calcification in the organs of dogs that had received repeated injections of Collip's parathyroid hormone.

All this evidence suggests that under certain conditions calcium deposition in tissues may occur readily without gross preliminary injury. Histological evidence, however, in no case excludes the possibility of some damage to the cells which is not revealed by microscopic techniques. Nevertheless, it may be that the calcification found by the German workers to occur in animals that have been receiving a marked excess of vitamin D is similar to that found in such conditions as osteomalacia and osteitis fibrosa in that it is independent of preliminary gross injury to the tissues. If this is the explanation such animals should show a pronounced hypercalcæmia. Klein [20] found a 50 per cent. increase in the blood calcium in his experimental rats, but as he did not state in what solvent his ergosterol had been irradiated, and did not report post-mortem findings, his figures lose their main value. Apart from this no investigations into the point have yet been reported.

Although Dixon and Hoyle [19] failed to confirm the results obtained by the German workers, they found calculi composed of calcium phosphate in the urinary tract, with secondary mechanical changes in many cases. This has been confirmed in unpublished experiments by the writer. Dixon and Hoyle pointed out the possible importance of these observations in the ætiology of urolithiasis in tropical countries, where calcium phosphate calculi are common, apart from bilharzia infection. They suggested that prolonged exposure to the very powerful solar rays of such climates might well produce excess of vitamin D in the skin; and this appears probable when it is considered that only about 2 per cent. of those rays which have maximum ability to produce vitamin D from ergosterol penetrate the pigment layer. Therefore, under normal conditions, irradiation of the skin ergosterol must occur in that part which is superficial to or included in the pigment layer, and this must apply also under conditions of excessive irradiation.

Vitamin A Deficiency.

The same authors further suggested that in the case of natives in tropical countries a second factor which is well established for some populations—lack of vitamin A [39]—might play an important part. It is known that deficiency of vitamin A predisposes to infective processes,[41-49] and that the urinary tract is frequently affected. Moreover, it has been shown [47 and 50-55] that with such a deficiency in the diet the formation of calcium phosphate calculi in the urinary tract is frequent and it is probable that the two conditions, infection and urolithiasis, are related as cause and effect.

In the case of populations habitually consuming diets defective in vitamin A and at the same time exposed to the possibility of forming excessive quantities of vitamin D from solar irradiation, it is obvious that the two factors would work in the same direction to produce urinary calculi. In this way a degree of deficiency of vitamin A or excess of vitamin D either of which acting separately might be quite inadequate to induce calculi formation, when acting together might well do so. Such a condition would illustrate clearly the significance of "vitamin balance" in the case of the fat-soluble accessory factors.

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MEDICINE AND THE LAW.

Acquittal on Charge of Criminal Abortion.

Dr. Daniel Evans Powell, of High-street, Tooting, was acquitted at the Central Criminal Court on March 27th on an indictment charging him with the manslaughter of Mrs. Doris Ruth Simmons, a London schoolmistress, and with using an instrument or other unknown means to procure her miscarriage. Dr. Powell, who pleaded "Not Guilty," was defended by Sir Patrick Hastings, K.C. The husband of the dead woman gave evidence that on Nov. 25th he went to Dr. Powell's surgery and told him that some capsules which the doctor had given his wife did not agree with her, and asked if he would give her something else. Dr. Powell, he said, gave him two bottles of medicine and a packet of lint. Next day Dr. Powell gave a certificate that Mrs. Simmons was suffering from influenza and rheumatism. After further visits from Dr. Powell, Dr. Le Maistre (the usual family doctor) was called in. On Dec. 10th, Dr. Powell gave another certificate that Mrs. Simmons was suffering from gastric enteritis. Sir Bernard Spilsbury, who made a post-mortem examination of the body on Dec. 14th, attributed the death to syncope as a result of abortion, septic condition, and inflammation of the kidneys. He stated in evidence that the abortion had, he considered, been brought about by the passage of an instrument, and that it must have been done by a skilled person. Dr. F. J. McCann, of Upper Wimpole-street, giving evidence for the defence, said that a woman suffering from nephritis might have a miscarriage in the early stages of pregnancy. The evidence of the deceased's symptoms, he said, disclosed a common condition, and there was nothing in the symptoms to indicate that miscarriage was other than natural. Dr. Powell in the witness-box denied having performed any operation. A half-hearted suggestion by the prosecution that he had administered morphia to the dying woman to prevent her making any admission or confession was also repudiated. It was complained by the defence that Dr. Powell had not had a proper opportunity of being represented at the post-mortem examination.

Dr. Powell had been committed for trial by the magistrate at the police-court for South-West London as well as on a coroner's jury's verdict of manslaughter. Mr. Ingleby Oddie's summing up at the inquest was to the effect that Mrs. Simmons, a schoolmistress, whose youngest child was 8 years old, was anxious to have no more children; that she spoke on this subject to her husband, to a Miss Marsh, who got her some pills which proved ineffective, and to Dr. Le Maistre, her family doctor, who strongly dissuaded her from any kind of attempted abortion, whether by drugs or otherwise; and that it was in these circumstances, when the pills and the medical adviser had failed her, that she had recourse to a doctor whom she had never before consulted. The recent verdict of "Not Guilty" at the Central Criminal Court cancels, of course, the coroner's jury's verdict of "Guilty of Manslaughter" delivered several weeks ago. As was pointed out last year in connexion with the trial of Mrs. Pace, there should be some provision by which a subsequent acquittal has the effect of removing from the records any trace of a verdict of "guilty" found by a coroner's jury.

The Locking of Parked Cars.

Recent prosecutions have drawn attention to the official prohibition of the practice of leaving a motor-car at a parking place in London with locked doors. This was made an offence by the London Traffic (Parking Places) Regulations, 1928, which prescribe not only where a car may be parked, but also the conditions of parking. The material parts of the London Traffic Act, 1924 (which authorised the making of such regulations) came into operation on Oct. 1st, 1924. The Minister of Transport made his first regulations on the subject in September, 1925. These contained a scheduled list of the prescribed parking places in London, and set forth various restrictions backed by a penalty of £5. Drivers, for instance, were not to leave their engines running, nor were taxi-cabmen to ply for hire while at a parking place. For our purpose the most important clause is that which required the driver of a parked car to comply with any directions given him by a constable in uniform, including a direction to move his car from one position to another. In January, 1928, this code of regulations was superseded by a fresh one. Again there was a scheduled list and a set of restrictions; but this time it was enacted (by Article 4) that a driver must not only move his car if required, but must also "so leave the vehicle that it may be removed or moved from one position to another by manual power." No doubt by this time the mechanical devices for locking cars had become more common. As a policeman is empowered in emergency to cancel any parking privilege, and as a policeman or other authorised person may move a parked car "for any reasonable cause," it is naturally difficult to allow cars to be locked. Motorists who have escaped prosecution have sometimes found that fate has dealt hardly with tyres and mudguards. The checking of theft has to be weighed against the importance of being able to move a stationary car. The stealing of dangerous drugs and scientific instruments from medical practitioners' cars has been by no means unknown. The insurance companies have doubtless made their representations to the police, and statements in Parliament indicate that the Home Secretary and the Minister of Transport will unite in the search for some satisfactory compromise. It is hard to deny the motorist his place in a public street, but parking is officially deemed a concession. The present system is extraordinary, in that the men in charge of a parking place are not regular officials; it is understood that they are not only unpaid by the Minister or by the police, but that they have actually to purchase a licence before they can undertake their duty. They look for remuneration, therefore, to the motorists they oblige.

The motorist's grievance is that he has been left unaware of the regulations, though the Minister states that a copy of them is exhibited at each parking place. It does not seem, however, that the regulations are to be deemed an instance of bureaucratic secrecy. Under the London Traffic Act all proposals for regulations have to be sent for advice and report to the Advisory Committee on which all interests (those of the private motorist as well as those of the Home Office, the Minister, the police, and the local

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DR. J. CLIFFORD HOYLE: REFERENCES.

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authorities) are represented. In this particular instance the Minister notified in the *London Gazette* in August, 1927, his intention to make regulations; his notification stated where copies could be obtained. When he actually made them in the following January a communiqué was issued to the press, and copies were laid before both Houses of Parliament for 28 days, during which objection could have been taken to them. But he would be an optimistic official who assumed that Members of Parliament read all the papers which are laid before the House, or that motorists make a regular study of the *London Gazette* or of the files of Statutory Rules and Orders. In this particular case the making of regulations seems to be safeguarded by adequate publicity, but we have now so many laws that we are obliged to be ignorant of some of them.

The Society of Apothecaries and Mr. Roche.

An advertisement in the "Personal" columns of the *Times* of March 28th conveys the thanks of Mr. Raphael Roche to his friends who signed the petition to the Society of Apothecaries, organised by Sir George Hume; it also announces that the Society is not proceeding with its contemplated action. The reference is understood to be to proceedings threatened by the Society of Apothecaries of London under the Apothecaries Act of 1815. Mr. Roche, unregistered as a medical practitioner, and uncertificated as an apothecary, was informed by the Society that, unless he would give an undertaking never again to act as an apothecary within the meaning of the Act while lacking the statutory qualification, legal action would be taken to restrain him and to recover penalties. The matter being no longer sub judice, it is possible to discuss the material issue whether Mr. Roche has, in fact, acted as an apothecary. In a case noted in THE LANCET some months ago it appeared that Mr. Roche had treated with powders a patient who shortly afterwards died of cancer; an analyst gave evidence at the inquest that the only discoverable ingredient of the powders was cane sugar; Mr. Roche did not throw any vivid light on the nature of his prescription; he stated that his method was to use drugs in intangible quantities.

The Act of 1815 referred in preamble to the charter of James I., which (subject to modifications) it confirmed. It recited the "duty of every person using or exercising the art and mystery of an apothecary to prepare with exactness and to dispense such medicines as may be directed for the sick by any physician lawfully licensed," and it penalises those who "knowingly, wilfully and contumaciously" refuse to compound medicines, or who compound them "deliberately or negligently, falsely, unfaithfully, fraudulently or unduly." Three sections of the Act are specially material. Section 14 forbids persons to practise as apothecaries in any part of England or Wales unless they have first been examined and have received a certificate of due qualification; Section 20 backs up this prohibition with a fine of £20; and Section 21 allows no apothecary to recover charges in a court of law unless he proves that he has a certificate to practise. This restriction upon practice by unqualified apothecaries still holds good; it was upheld in litigation in 1885 and on other occasions. So far as the decided cases go, they seem to show that at first, when the 1815 Act was newly passed, an apothecary was regarded as a mere compounder of prescriptions. Later, to judge by a case in 1843, the apothecary had established himself as a person who applied himself to the cure of disease by medicine. It would have been interesting to have had a judicial decision on the issue whether Mr. Roche's treatment by powders containing cane sugar and other intangible ingredients does or does not amount to acting as an apothecary. A letter from his solicitors, quoted in a recent newspaper article, contends that the 1815 Act was designed to protect the public from quackery, and that the Act does not apply to Mr. Roche. They repeat the claim that he has cured or saved the lives of many people whom qualified men have been unable to assist. This kind of claim is one which no known form of judicial proceeding can with confidence establish or refute. Mr. Roche's treatment is not fully disclosed; in the popular, if not in the statutory, sense it is an art and mystery. Perhaps the only adequate method of settling such an issue is one which is unlikely to be attempted—namely, for Mr. Roche's treatment of patients to be examined at close quarters, stage by stage, by a tribunal of experts with full scientific knowledge and full opportunity of inspection. Meanwhile the Society of Apothecaries is in an uncomfortable dilemma. Either it must prosecute the uncertificated practitioner or it must seem to abrogate an important part of its corporate functions. Under English law an Act of Parliament never becomes inoperative through mere disuse; it is alive until it is definitely repealed. If it has outlived its usefulness, and is not supported by popular opinion, magistrates will inflict only negligible or nominal penalties for breach of its provisions. The Apothecaries Act of 1815 has been, and still is, far too valuable to be treated as in any sense obsolete. The Lord Mayor, prompted apparently by what others have told him of Mr. Roche, has intervened in this particular case to dissuade the Society of Apothecaries from taking proceedings. It should, nevertheless, not be assumed that the statute is dead or that its administration is a matter of personal considerations.

UNITED STATES OF AMERICA.

THE WORK OF THE PUBLIC HEALTH SERVICE.

Annual Report of the Surgeon-General.

THE 1928 report of the Surgeon-General of the United States Public Health Service not only summarises all the activities of the Divisions of the Service, but also serves as an index for special reports on much research work. It opens with a survey of health conditions throughout the world. The outbreak of plague in the Argentine was a special menace but only two cases occurred in the States, both being associated with the long-standing infection of the ground squirrels in California. The cholera situation in India is referred to as more serious than in any of the previous eight years except 1924. Cholera did not appear in the United States, but was reported in the Philippines during the summers of 1927 and 1928. Yellow fever appeared in West Africa in June, 1928, after several months' absence. There have been sporadic cases in Brazil and, in 1928, an epidemic in Rio de Janeiro, but it was not reported in the U.S.A., the last outbreak having been in 1905. Small-pox was unduly prevalent in view of the known methods of prevention. In Algeria it was epidemic in serious form; in Russia it was largely a rural disease, owing to the rigid enforcement of vaccination in the towns. In 41 of the States there were in 1925, 1926, and 1927 38,877, 31,534, and 33,750 cases respectively, with 712, 367, and 159 deaths. The experience of Detroit, Minneapolis, and Los Angeles from 1924–26 showed that the virulent type may appear without warning and cause hundreds of deaths in a single city within a few months.

During the summer and autumn of 1927 there was a widespread outbreak of infantile paralysis in the U.S.A., with a high case-fatality. The cases reported in 36 States during the last three years numbered 5585, 2445, and 8808, and the deaths 1335, 728, and 1710, giving a case-fatality of nearly 25 per cent. for the period. The deaths from pellagra (5148) showed an increase, consequent upon unfavourable industrial and economic conditions in the Mississippi valley flood area and other regions. Special researches on the anti-pellagrous properties of various foodstuffs have been made and dried yeast was made available in the flood districts.

Before 1921 the case- and death-rates from diphtheria were rising. From 1921–26 there was an

London) 1·67. In the same week the death-rate from all causes for the 107 great towns was 21·4, the highest figures being Birmingham 24·5 and Sheffield 23·1. More than 20 deaths were still attributed to influenza in the following towns—namely: Birmingham, 93; Sheffield, 52; Bradford, 32; Sunderland, 27; Bristol, 22; Nottingham, 21. In Liverpool 20 deaths were ascribed to measles; 10 in Sunderland. The deaths from whooping-cough remain widely scattered over the country, Manchester heading the list with 14, Liverpool recording 11, Leeds 9, Swansea 8, West Bromwich 7, and Hull 6.

The number of stillbirths registered during the week was 315 (corresponding to a rate of 43 per 1000 births), including 60 in London.

Deaths from Small-pox.—With regard to the death in the county borough of Derby assigned to small-pox by the Registrar-General in the return for the week ended March 16th, Dr. A. E. Brindley, medical officer of health, informs us that the patient was a man aged 61 years, vaccinated in infancy, but not revaccinated. He was the father of a son, aged 27 years, who was removed to the small-pox hospital on Feb. 27th. The man himself was kept under observation and on March 15th was found to be seriously ill by Dr. Haigh, assistant medical officer of health, no other doctor having been in attendance. He died a few hours later, the symptoms being apparently those of the influenzal pneumonic type. He had one or two small-pox spots, and death was certified as (1*a*) pneumonia, (*b*) influenza; (2) small-pox. It is quite possible in this case, Dr. Brindley adds, that the man died from influenzal pneumonia, but if so he had undoubted small-pox at the same time.

A second fatal case, which occurred in the Metropolitan Borough of Finsbury, was that of a male infant aged 8 months, one of twins both unvaccinated, who died rather suddenly on March 8th after having been ill for about two days. Dr. A. E. Thomas, medical officer of health, who saw the body shortly after death, noted blotchy hæmorrhages on both flanks and thighs ranging in diameter from one-eighth to three-eighths inch. Their distribution complied with the known distribution of hæmorrhagic small-pox but the blotches were larger than those usually described. Up to the present no other case of small-pox has occurred in the family or in the house and the diagnosis of hæmorrhagic small-pox is regarded as provisional. The post-mortem examination disclosed no obvious cause of death and there was no inquest.

Provisional Death-rates.

The Registrar-General gives the provisional death-rates per million population for England and Wales during the year 1928, as follows:—

	Males.	Females.	Persons.
Respiratory tuberculosis	879	641	755
Other tuberculosis	188	159	173
Cancer	1377	1469	1425

In the same year the provisional mortality of women in childbirth from puerperal sepsis was 1·80, from other accidents and diseases of pregnancy and parturition 2·63, the ratio in each case being per 1000 live births.

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Correspondence.

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A legal opponent in a case of this description knows full well that the chances of finding a fracture are such that an X ray is imperative, and the expense of the photograph more than justified. Why should not the doctor think so too, and be first in the field? From experience at the Union, and in my own work, fractures have been found in many unsuspected cases; especially recently have I found them in the skull. I have found that the advice of the Union is wise, and I have been saved considerable discomfiture thereby. For these reasons I do not think that Dr. Ward should demur at putting a patient to the comparatively small cost of an X ray photograph considering the issues at stake on both sides. Rather would I suggest that he might look upon the time and money spent as an excellent form of insurance both for himself and his patient.

I am, Sir, yours faithfully,
HORACE HILL, M.R.C.P.

Gillingham Green, Kent, April 2nd, 1929.

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To the Editor of THE LANCET.

SIR,—It is well for a culprit to make a full confession of his misdeeds, so I was glad to read Dr. Carozzi's letter in your issue of to-day. The charge was that Dr. Carozzi had strung together the dicta of various writers (some unnamed, all without bibliographical references), the accuracy and relevance of which he had neither appraised nor had sufficient technical knowledge (statistical and other) to appraise.

Dr. Carozzi—angrily, of course, but explicitly—pleads guilty, and even gives us a sketch of himself at work with scissors and a paste pot, joining the opinions of A to the observations of B and the speculations of C. What is it to him whether A's opinions were correct, the observations of B typical, or the speculations of C credible? D finds that 16 per cent. of the deaths known to him were due to tuberculosis, E has found 75 per cent.; F actually finds that from a third to half the living workers examined by him were suffering from pulmonary tuberculosis. What does it matter to Dr. Carozzi that proportional mortality is a function of age distribution and the diagnosis of tuberculosis a function of the standard of examination; what does he care whether like is being compared with like! A, B, C, D, E, and F are "authorities," one adds their several authoritativenesses together and reaches the sham omniscience of the Geneva brochure.

> Non tali auxilio nec defensoribus istis
> Tempus eget.

Every great newspaper has on its staff journalists as competent as Dr. Carozzi, straightforward men not professing to be anything *but* journalists. It is indeed well that Dr. Carozzi should have explained his position.

I am, Sir, yours faithfully,
March 30th, 1929. MAJOR GREENWOOD.

THE EMPLOYMENT OF BACTERIA IN MODERN WARFARE.

To the Editor of THE LANCET.

SIR,—According to newspaper reports, Sir Berkeley Moynihan has publicly repeated the allegation that during the late war plague bacilli were employed by the German Army. Our distinguished colleague might well have been expected to make absolutely sure of his facts before venturing to proclaim such an accusation. Yet not only has our Government solemnly denied having used such methods, but even experts of the allied countries have borne out this statement —e.g., Dr. Paul, head of the French Poison Gas Service. What is more, the employment of bacteria was not even planned! We and our colleagues who were hygienic advisors to the Army in France and Belgium were never consulted on this question from beginning to end of the war.

But quite apart from these considerations, it is obvious to every bacteriologist that pathogenic bacteria are totally unsuitable as implements of warfare, since their action is uncertain, their range of action limited, and the danger to the troops employing them far too great. These arguments were fully stated by one of us (Pf.) in a report made at the request of the League of Nations shortly after the war; they were endorsed by Dr. Thorvald Madsen, President of the Hygiene Organisation of the League of Nations: (1) Owing to their rapid loss of virulence, all pathogenic bacteria cannot be kept at a high and constant level of infectivity. (2) But even assuming this problem to have been mastered, the technique of transmitting the bacteria to the enemy presents insurmountable difficulties. In explosive missiles bacteria would be instantly destroyed by the heat of explosion. (3) If flasks of culture were projected —e.g., from aeroplanes—there is hardly the faintest chance of infecting a few isolated persons, but never of setting up epidemic foci, whilst any bacteria not at once penetrating into the body would speedily die. (4) As regards the idea of infecting rats and letting them loose in the direction of the enemy's lines, this would manifestly be a far greater danger to our own troops, who would thus be "hoist by their own petard."

We can therefore but regret that a man of such high professional standing and knowledge should propound these unfounded and erroneous statements. This is the more to be deprecated because of the harm thus caused to the spirit of mutual understanding and scientific intercourse which is gradually beginning to replace war- and post-war-psychosis. Ten years after the war we Europeans have more serious anxieties than to repeat disproved accusations!

We are, Sir, your obedient servants,
RICHARD PFEIFFER, M.D.Berl., F.R.S.Lond.,
Emeritus Professor of Hygiene in the University of Breslau.

CARL PRAUSNITZ, M.D. Bresl., M.R.C.S. Eng., L.R.C.P. Lond.,
Professor of Hygiene in the University of Breslau.
Breslau, March 24th, 1929.

⁂ The reference is to a remark made by Lord Moynihan at the Authors' Club on Feb. 25th when, as reported in the *Times* of the following day, he said: "We heard in 1916 that the Germans were going to use plague as a lethal weapon and we actually recovered plague bacilli from bombs dropped over the Fifth Army." In the History of the Great War based on Official Documents (Medical Services, Hygiene of the War, Vol. II., 1923) Major T. J. Mitchell, dealing with prevention of plague, stated (p. 458): "On the Western front in February, 1916, it was rumoured that the Germans might use plague as an offensive weapon against the allied armies, but this was considered highly improbable," and (p. 460): "In January, 1918, the D.M.S. of the Fifth Army reported that the mobile laboratory in his area had examined some material dropped by an enemy balloon, and that bacilli resembling the *Bacillus pestis* had been isolated." *We are glad to have* this authoritative assurance from high German sources that no such offensive weapon was used.—ED. L.

GAMMA RADIATION.

To the Editor of THE LANCET.

SIR,—In reply to Sir Charles Gordon-Watson and Mr. Stanford Cade, we had thought it was common knowledge that beta rays will not pass through such screens as we used, and that the length of a container has nothing whatever to do with the nature of the radiations it transmits. It is disappointing that "after careful perusal" of our note our critics failed to discover that we only suggested the use of an old-fashioned method in cases where other measures were inapplicable. We were at pains to state the dosage of gamma rays which produced necrosis and to indicate the dosage which seemed to give the best results.—We are, Sir, yours faithfully,

CECIL P. G. WAKELEY.
HECTOR A. COLWELL.
King's College Hospital, S.E., March 28th, 1929.

The Services.

ROYAL ARMY MEDICAL CORPS.

Maj.-Gen. W. H. S. Nickerson, late R.A.M.C., is placed on half pay.

Col. H. Ensor, late R.A.M.C., to be Maj.-Gen., vice Maj.-Gen. Nickerson.

Lt.-Col. L. M. Purser, from R.A.M.C., to be Col.

Maj. and Bt. Lt.-Col. W. P. MacArthur to be Lt.-Col., vice Lt.-Col. Purser.

Maj. J. T. Simson, from R.A.M.C. Res. of Off., to be Maj.

Temp. Lt. G. F. Maher relinquishes his commn.

Lt. (on prob.) H. E. Knott, from the secd. list, is restd. to the estabt.

ARMY RESERVE OF OFFICERS.

Lt.-Col. F. W. Cotton, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

TERRITORIAL ARMY.

Lts. G. Tudhope and D. Jack to be Capts.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Lt.-Col. E. J. D. Taylor, having attained the age limit, relinquishes his commn. and retains his rank.

ROYAL AIR FORCE.

Flying Officer E. J. T. McWeeney is promoted to the rank of Flight Lt.

Flying Officer G. M. Titterington (temp. Lt., General List, Army Dental Surgeon) relinquishes his temporary commission in the R.A.F. on completion of service.

INDIAN MEDICAL SERVICE.

Majs. to be Lt.-Cols.—A. J. Lee, C. H. Smith, A. MacD. Dick, M. J. Holgate, T. L. Bomford, W. A. M. Jack, A. C. Anderson, Keshav Sadashiv Thakur, E. H. V. Hodge, G. T. Burke, M. A. Nicholson.

To be Lts. (on prob.).—K. F. Alford, H. J. Curran, H. T. McWilliams, P. Shannon, G. J. O'Connor, B. J. Griffiths, E. A. Y. Mackeown, H. S. Waters, W. P. Lappin, G. Milne, A. M. Fraser, D. L. Trant, and W. Walsh.

Lt.-Col. R. M. Barron retires.

London) 1·67. In the same week the death-rate from all causes for the 107 great towns was 21·4, the highest figures being Birmingham 24·5 and Sheffield 23·1. More than 20 deaths were still attributed to influenza in the following towns—namely: Birmingham, 93; Sheffield, 52; Bradford, 32; Sunderland, 27; Bristol, 22; Nottingham, 21. In Liverpool 20 deaths were ascribed to measles; 10 in Sunderland. The deaths from whooping-cough remain widely scattered over the country, Manchester heading the list with 14, Liverpool recording 11, Leeds 9, Swansea 8, West Bromwich 7, and Hull 6.

The number of stillbirths registered during the week was 315 (corresponding to a rate of 43 per 1000 births), including 60 in London.

Deaths from Small-pox.—With regard to the death in the county borough of Derby assigned to small-pox by the Registrar-General in the return for the week ended March 16th, Dr. A. E. Brindley, medical officer of health, informs us that the patient was a man aged 61 years, vaccinated in infancy, but not revaccinated. He was the father of a son, aged 27 years, who was removed to the small-pox hospital on Feb. 27th. The man himself was kept under observation and on March 15th was found to be seriously ill by Dr. Haigh, assistant medical officer of health, no other doctor having been in attendance. He died a few hours later, the symptoms being apparently those of the influenzal pneumonic type. He had one or two small-pox spots, and death was certified as (1*a*) pneumonia, (*b*) influenza; (2) small-pox. It is quite possible in this case, Dr. Brindley adds, that the man died from influenzal pneumonia, but if so he had undoubted small-pox at the same time.

A second fatal case, which occurred in the Metropolitan Borough of Finsbury, was that of a male infant aged 8 months, one of twins both unvaccinated, who died rather suddenly on March 8th after having been ill for about two days. Dr. A. E. Thomas, medical officer of health, who saw the body shortly after death, noted blotchy hæmorrhages on both flanks and thighs ranging in diameter from one-eighth to three-eighths inch. Their distribution complied with the known distribution of hæmorrhagic small-pox but the blotches were larger than those usually described. Up to the present no other case of small-pox has occurred in the family or in the house and the diagnosis of hæmorrhagic small-pox is regarded as provisional. The post-mortem examination disclosed no obvious cause of death and there was no inquest.

Provisional Death-rates.

The Registrar-General gives the provisional death-rates per million population for England and Wales during the year 1928, as follows:—

	Males.	Females.	Persons.
Respiratory tuberculosis	879	641	755
Other tuberculosis	188	159	173
Cancer	1377	1469	1425

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Burton was a deservedly popular man with the public as well as with his professional colleagues, and although his time was almost over-occupied by the demands of his practice, he was both a fisherman and a golfer and a good musician. He is survived by his widow, two sons, and two daughters.

JAMES McHUGH, M.B. LIVERP.

It is with deep regret that we record the sudden death after a brief illness of Dr. James McHugh, of Waterloo. Educated at Liverpool Institute, he entered the medical school of the University in 1922. Possessed of a strong physique, good mental ability, and unusual powers of concentration, he readily achieved the highest honours of a student's career. After being awarded the Derby exhibition in medicine, he graduated in 1927 with first-class honours and distinctions in medicine and surgery. After 12 months' residence at the Royal Infirmary, first as house physician and then as house surgeon, feeling that general practice offered a closer contact with patients and a more human interest than consulting work, he became assistant to Dr. W. R. Rowlands, of Waterloo Park. In the course of his work he contracted pneumonia and died at the Royal Infirmary, after a week's illness, on March 31st. His death has brought to a premature close a career of great promise; he will be missed as a loyal colleague, a charming personality, and a faithful friend.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—The Manson Medal, awarded triennially, is to be presented this year to Sir Ronald Ross. It was founded in memory of Sir Patrick Manson in 1922 and has been awarded to Sir David Bruce and Senator Ettore Marchiafava. Qualifications for the medal are contributions of outstanding merit to knowledge of tropical medicine and hygiene.

The Chalmers Medal was founded in 1921 by Mrs. Chalmers in memory of her husband, Dr. Albert J. Chalmers. It is awarded every second year to a worker in the field of tropical medicine and hygiene who must be under 45 years of age on June 1st of the year of award. It is to be presented this year to Major J. A. Sinton, V.C., I.M.S. Previous awards have been made to Prof. E. Roubaud, Prof. Warrington Yorke, and Dr. H. Lyndhurst Duke.

Though the Manson Medal was founded in memory of Sir Patrick Manson, an attempt is being made to found a more substantial memorial in the shape of a permanent home for the society. To this end the Manson House Fund was started, and already subscriptions have brought in between four and five thousand pounds, while three thousand pounds have been promised on loan without interest. It is hoped that a sufficient sum will be raised to enable the society to purchase suitable premises which will form its headquarters. Sir Patrick Manson was the first president.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

THE EASTER RECESS.

PARLIAMENT adjourned for the Easter Recess on Wednesday, March 27th. The Royal Assent was given to the Local Government Act, the Factories and Workshops (Cotton Cloth Factories) Act, and other Acts. The House of Commons will reassemble on April 15th and the House of Lords on the 16th.

RECONSTITUTED CREAM BILL.

In the House of Commons on March 26th, on the motion for the third reading of the Reconstituted Cream Bill, a measure designed to prevent reconstituted cream being sold to the public as farm cream,

Mr. A. V. ALEXANDER said that to the general idea of the Bill the Opposition had no objection. If tradesmen in general were offering for sale as cream something which was not cream direct from the farm the public were entitled to know. Grave difficulties would, however, be set up for the tradesmen who would be using the reconstituted article to take the place of cream which they could no longer get in satisfactory quantities to keep for the length of time necessary for their manufacturing purposes. There was nothing in the Bill to prevent the public from believing that they were getting, either direct or in restaurants, actual cream, when what they actually were getting was really much inferior in its constituents to reconstituted cream. The Bill did nothing to protect the public against substitutes for cream which were most injurious to them.

Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) said Mr. Alexander had based his opposition to the Bill mainly on the ground that it did not apply to what was called synthetic cream. But that substance was already provided for under the Food and Drugs (Adulteration) Act, and therefore there was no need for any provision covering it in this measure. This Bill provided that the surplus milk of the country should be used, but used honestly. If milk was used to make what was known as reconstituted cream it was only fair that the general public should know what they were receiving and paying for.

The Bill was read the third time and passed.

HOUSE OF LORDS.

TUESDAY, MARCH 26TH.

LOCAL GOVERNMENT (SCOTLAND) BILL.

THE House went into Committee on the Local Government (Scotland) Bill, the Earl of DONOUGHMORE in the chair.

Transfer of Certain Functions to County Councils.

On Clause 2 Lord ARNOLD moved a new proviso to the effect that public health functions should not be transferred from a Royal burgh or from a burgh with a population of 10,000 and upwards unless not earlier than one year from the passing of the Act such a burgh was certified by the Central Department to be inadequately equipped for administering such functions. He said that there was no such provision in the English Bill. Under this Bill the conduct of health services was being taken away from small burghs and handed over to the county councils. In England 400 such small communities with populations under 5000 were administering identical, or very similar, functions.

The Earl of ONSLOW (Paymaster-General) said that it was quite true that these small burghs had done their work very well indeed, but the policy of the Bill was to transfer the wider functions to reconstituted county councils in order to make them of adequate resource and strength for their new duties. This amendment would cut at the roots of the Bill, because it aimed not only at efficiency, but at simplicity in administration.

The amendment was by leave withdrawn.

Medical Officers of Health and Sanitary Inspectors.

On Clause 35 Viscount YOUNGER OF LECKIE moved an amendment to make it compulsory that where there was a vacancy in the office of medical officer of health in a small burgh the county medical officer of health should be at once appointed to the vacancy.

The Marquess of SALISBURY (Lord Privy Seal) said that he did not deny that very often the arrangement suggested by Lord Younger might be by far the best one. But it seemed to the Government that it would be a pity to make it absolutely compulsory in every case, and some kind of power should be left to the Secretary of State to see that in particular cases where the circumstances were such that the appointment of a special man might be good for the burgh it should not be compulsory that the county medical officer should be appointed to the vacancy. If the noble lord was not satisfied he would look into the point before the report stage and see if any more could be done.

Viscount YOUNGER OF LECKIE said that he thought that it was clearly desirable that the medical officer of health for the county should have supervision over the whole of these burghs. The continuation of these officers in small burghs was a great mistake and very expensive.

The amendment was by leave withdrawn.

On Clause 72, which enables the Secretary of State to make

Orders for Bringing the Act into Operation,

the Marquess of SALISBURY said that on the second reading of the Bill he had expressed his assurance that the Government were not averse to considering modifications of the clause as originally drafted. They were quite willing to strike out Subsection 1 which gave the Secretary of State power to modify this Bill in any respect he might hereafter think necessary in order to bring the machinery into operation. There was much criticism against such sweeping powers, and the Secretary of State had come to the conclusion that it was not really necessary to have that power at all. The Government were therefore willing to delete the subsection. Subsection 2 was not quite the same, as it provided power to modify other Acts of Parliament which might be difficult to adjust with respect to this particular Bill. In determining the protection given in that case the Government had naturally looked to the provision put by their lordships into the English Bill. That protection consisted of an affirmative resolution; the changes sought to be made by the Order of the Secretary of State did not operate except for a short time unless by affirmative resolution of both Houses of Parliament in favour of the change. In addition they did not desire that this power of modifying Acts of Parliament should be perpetual, and they provided that an Order of this kind should only be possible up to the end of 1930. What remained was the power to modify local Acts of Parliament, and the Government must adhere to the original proposals in that limited jurisdiction, because the local Acts of Parliament were very numerous and they had no means of ascertaining what they were.

Amendments were inserted in the Bill to carry out the intentions of the Government in accordance with Lord Salisbury's statement.

The Committee stage of the Bill was concluded and the Bill was reported as amended to the House.

HOUSE OF COMMONS.

TUESDAY, MARCH 26TH.

Deaths from Coal-gas Poisoning.

Mr. BOWERMAN asked the President of the Board of Trade whether his attention had been drawn to the fact that during the past 15 years deaths due to coal-gas poisoning had increased from 170 to 1142; that during that period the percentage of carbon monoxide, the chief poisonous contituent of coal-gas, had been raised from 7 per cent. to as much as 15 per cent., and in some cases to 20 per cent., such increase militating against the recovery of persons accidentally poisoned by gas; and whether he was prepared to give consideration to the recommendation of the committee appointed in 1921 to the effect that if the freedom from limitation in the use of carbon monoxide was proved to be accompanied by unexpectedly unfavourable results, the attention of Parliament should again be directed to the matter.—Sir P. CUNLIFFE-LISTER replied: My attention has been directed to the statistics of gas poisoning cited by the right hon. Member, and more particularly since the Report of the Committee on Carbon Monoxide in 1921. The situation has been carefully watched and relevant information collected. When reference is made to the number of deaths due to gas poisoning it is necessary to bear in mind how large a proportion are cases of suicide. But I think that it would be desirable that a small but experienced committee should review the developments which have taken place since the Pearce Committee sat in 1921; and I propose to appoint such a committee.

Outrages on Women in Trains.

Mr. MORRIS asked the Minister of Transport whether his attention had been drawn to the number of outrages committed upon women in non-corridor trains; and would he make representations to the railway companies that all passenger trains should have corridor carriages only.—Colonel W. ASHLEY replied: So far as my information goes deplorable incidents such as those to which the hon. Member refers are of rare occurrence. I am not prepared to press railway companies to discontinue entirely the use of non-corridor stock, but I will call their attention to the hon. Member's suggestion.

Milk for Public Health Purposes.

Mr. POTTS asked the Minister of Health whether he would introduce immediate legislation to amend the law so as to ensure that every purchaser of milk should be supplied with milk containing not less than a legal standard of milk fat and milk solids, other than milk fat, relating to services for the treatment of tuberculosis, maternity, and child welfare, &c., administered by public authorities under the Public Health Acts.—Sir KINGSLEY WOOD replied: Apart from any question as to the practicability of the proposal, my right hon. friend could not undertake to introduce legislation on the subject at the present time.

WEDNESDAY, MARCH 27TH.

The London Lock Hospital.

Viscountess ASTOR asked the Minister of Health what changes in administration he was proposing as a result of the recommendations of the report of the committee of inquiry into the London Lock Hospital; and whether the constitution of the board of management had been so changed as to give a greater choice of women.—Sir KINGSLEY WOOD replied: As indicated in reply to questions on this subject on March 14th the hospital is a voluntary institution, and reponsibility for carrying recommendations of the Committee into effect rests, not with my right hon. friend, but with the board of the hospital. My right hon. friend has not yet received specific proposals from the board as to their reconstitution, but he understands that they contemplate the inclusion of women on the board in future.

Public Health Conference at Zurich.

Mr. HARRIS asked the Minister of Health why he had refused to sanction the attendance of delegates from municipal councils to the forthcoming conference in Zurich of the Royal Institute of Public Health.—Sir KINGSLEY WOOD replied: My right hon. friend has given careful consideration to the application of the Institute in this matter and he does not feel satisfied that benefits commensurate with the considerable expense involved would be obtained by the attendance at the cost of the rates of delegates from local authorities at the conference.

National Health Insurance.

Mr. KELLY asked the Minister of Health the number of men, women, and young persons insured under the National Health Insurance Act at the end of 1928.—Sir KINGSLEY WOOD replied: The number for Great Britain is estimated to be 16,950,000, of whom 11,550,000 are men and 5,400,000 are women. These numbers include 790,000 persons who, having reached 65 years of age, have ceased to pay contributions under the Act and to be entitled to sickness and disablement benefits.

Grant to British Social Hygiene Council.

Captain CROOKSHANK asked the Secretary of State for the Colonies what, if any, conditions were attached to the grant of £500 made to the British Social Hygiene Council; and whether the grant was made after consultation with the Minister of Health.—Mr. AMERY replied: This grant is made to assist the Council in organising propaganda work in the Colonies, &c. Its employment is limited to certain specified services, such as the supply of films and medical and educational literature. Payments out of the grant are made only in reimbursement of certified expenditure on approved services. The grant has not recently been the subject of discussion with the Minister of Health, who has no responsibility for work of this kind in the Colonies.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates were successful:—

Surgery.—K. Girgis (Sect. II.), Manchester and Charing Cross Hospital; D. H. Haler, King's College Hospital; H. H. Lakin, Birmingham and London Hospital; and A. W. Tam, Singapore and Edinburgh.
Medicine.—A. Clark, Glasgow and London Hospital; J. M. Connor, St. Mary's Hospital; R. W. Goldsbrough, Leeds; and R. W. Scanlon, St. Thomas's Hospital.
Forensic Medicine.—R. W. Goldsbrough, Leeds; R. K. Nandlal, Birmingham; and K. M. Seedat, Charing Cross Hospital.
Midwifery.—I. M. Iddali and V. R. D. Lahaumi, Manchester; J. E. Moody, St. Mary's; Z. Risk, Birmingham; A. W. Tam, Singapore and Edinburgh; and E. O. Watson, St. Bartholomew's Hospital.

The Diploma of the Society was granted to the following, entitling them to practise medicine, surgery, and midwifery: J. M. Connor, K. Girgis, D. H. Haler, and R. W. Scanlon.

UNIVERSITY OF ABERDEEN.—At a graduation and diplomas ceremony on March 27th the following degrees were conferred:—

LL.D. (Hon.).—Major Walter Elliot, M.B., M.P.
M.D.—*In absentia:* *E. G. A. Don and *C. R. Philip.
In person: *W. E. McCulloch, A. W. Badenoch, H. B. Cook, Duncan McLellan, W. F. Munro, and S. S. Proctor.

*Awarded Commendation for Thesis.

M.B. Ch.B.—H. M. Trethowan (with Second-class Honours). W. H. Anton, N. D. Begg, Allan Brebner, Elizabeth R. Cairns, T. W. F. Cameron, Donald Fraser, H. C. R. Gunter, Ali Hassan, Grace Krogh, I. M. Munro, D. B. Robb, D. S. Smith, L. M. Watson, J. P. Weir, J. C. Wishart, and A. P. Youngson.

D.P.H.—R. J. Clark, Victoria C. Ensile, A. M. Fraser, and J. S. Harper.

UNIVERSITY OF DURHAM.—At a Convocation on March 22nd *the following degrees were conferred* :—

M.B., B.S.—Andrew Davis, Katharine M. Girling, J. A. Lennox, D. C. Livingston, William Mair, J. H. F. Pankhurst, J. H. Pool, J. W. M. Stevenson, and Howard Willcox.

At recent examinations the following candidates were successful :—

THIRD EXAMINATION FOR M.B., B.S.

Pathology and Bacteriology; Materia Medica, Pharmacology and Pharmacy; Public Health; Medical Jurisprudence.—R. H. Clayton.

The same subjects with General Principles of Therapeutics.—*J. K. Stanger, H. H. D. Anderson, A. G. Craven, Edna T. Everdell, P. N. Grinling, Lily Haugh, J. R. Hindmarsh, William Hunter, Kathleen N. W. Kearney, Gwendoline M. Langham-Hobart, W. D. McF. Millar, Thelma Mouat, Samuel Olswang, H. J. Peters, J. D. Rose, W. G. A. Swan, F. H. Taylor, and J. E. Wilson.

* Second-class honours.

Sir William Prout has relinquished his appointment as Consulting Physician to the Colonial Office and the Crown Agents for the Colonies. Dr. Philip Manson-Bahr has been appointed one of the Consulting Physicians in London.

FOOD EDUCATION SOCIETY.—Dr. Harry Campbell will lecture on Common Errors in Diet at 20, Gordon-square, London, W.C., at 3 P.M. on Wednesday, April 10th, and at week later at the same hour and place Mr. Charles Hecht, hon. secretary of the Society, will speak on Aids to Fitness.

CENTRAL ASSOCIATION FOR MENTAL WELFARE.—A Conference on Mental Welfare will be held, under the auspices of this Association, in the Central Hall, Westminster, on Thursday, April 25th, and Friday, the 26th. The Conference will be opened by Mr. Neville Chamberlain, the Minister of Health, and the speakers will include Mr. L. G. Brock, chairman of the Board of Control; Dr. A. F. Tredgold, and Dr. Ralph Crowley. Application for the full programme and for tickets should be made to the hon. secretary of the Association, 24, Buckingham Palace-road, London, S.W. 1.

HOSPITALS AND MOTOR ACCIDENTS.—In consequence of a suggestion made by Sir Arthur Stanley the Royal Automobile Club is organising a fund for the benefit of hospitals especially affected by road accidents. The money will be distributed without deductions for expenses in collaboration with the British Hospitals Association.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, April 8th.—4.30 P.M., WAR. Annual General Meeting: Election of Officers and Council. Discussion on Functional Diseases of the Nervous System. Opener: Colonel J. C. Kennedy, R.A.M.C. To be followed by Surgeon Rear-Admiral E. T. Meagher, R.N., and Squadron Leader M. L. Burton.

TUESDAY.—5 P.M., ORTHOPÆDICS. Papers: Mr. W. H. Ogilvie: Recent American Papers on Bone Tumours. Mr. R. Watson-Jones: Wrist Dislocation with Associated Nerve Lesions. To be followed by a discussion. 8 P.M., PSYCHIATRY. Joint Meeting with the British Psychological Society (Medical Section). Discussion: The Rôle of Anxiety in the Psychoses and Psychoneuroses. Speakers: Dr. Ernest Jones, Dr. H. Yellowlees, Dr. R. D. Gillespie, and others.

THURSDAY.—8.30 P.M., NEUROLOGY. Discussion on Disseminated Encephalomyelitis.

SOCIETY FOR THE STUDY OF INEBRIETY.

TUESDAY, April 9th.—4 P.M. (in the Rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, W.), Dr. John Davy Rolleston will open a discussion on Alcohol in Therapeutics.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, April 9th.—3.15 P.M., Mr. A. M. Zamora: Hoarseness.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.

WEDNESDAY, April 10th.—1.30 P.M., Examination and Diagnosis of the Nose.

FRIDAY.—4 P.M., Mr. A. Ryland: The Musculature of the Vocal Cords.

ROYAL DENTAL HOSPITAL OF LONDON POST-GRADUATE LECTURES, Leicester-square, W.C.

WEDNESDAY, April 10th.—6 P.M., Mr. *Bowdler Henry*: Lecture Demonstration on Diathermy in Dental Surgery.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, April 8th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.

ANCOATS HOSPITAL POST-GRADUATE LECTURES, Mill-street, Manchester.

THURSDAY, April 11th.—4.15 P.M., Dr. Twining: X Ray Findings in Diseases of the Chest.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, April 9th.—4.15 P.M., Mr. J. P. Buckley: Pain after Food.

FRIDAY.—4.15 P.M., Mr. E. D. Telford: Demonstration of Surgical Cases.

Appointments.

FERGUSON, J., M.B., B.Ch. R.U.I., D.P.H., has been appointed County Medical Officer for Surrey.

McMAHON, A. D., M.B., B.Ch. N.U.I., D.P.H., County Medical Officer of Health for Carlow.

ROBERTS, D. R., M.B. Durh., Certifying Surgeon under the Factory and Workshop Acts for the New Tredegar District of Monmouth.

Salford Royal Hospital: THORNTON, T., M.B., Ch.B. St. And.; and MAXWELL, R. J. C., M.B., Ch.B. Belf., House Surgeons.

Vacancies.

For further information refer to the advertisement columns.

Aberdeen Royal Infirmary.—Jun. Asst. Ophth. Surg.
Altrincham General Hospital.—H.S. At rate of £105.
Ascot Heatherwood Hospital.—Res. Asst. M.O. £300.
Ashton-under-Lyne, District Infirmary.—H.S. At rate of £150.
Ayr County Hospital.—Sen. Res. H.S. At rate of £100.
Bath, Royal United Hospital.—Asst. H.S. At rate of £100.
Bedford County Hospital.—H.S. At rate of £175.
Birmingham, Selly Oak Hospital.—Cas. O. At rate of £200.
Bolingbroke Hospital, Wandsworth Common, S.W.—H.P. At rate of £120.
Bombay, Goculdas Tejpal Hospital.—Hon. Surgeon. Rs.150 per mensem.
Bootle County Borough.—Asst. Sch. M.O. &c. £600.
Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.
Bury St. Edmunds, West Suffolk General Hospital.—H.S. £150.
City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.
Colchester, Essex County Hospital.—H.S. £175.
Connaught Hospital for Walthamstow, &c., Orford-road, Walthamstow, E.—Res. H.P. and Res. H.S. Each at rate of £100.
Denbigh, North Wales Sanatorium.—Third A.R.M.O. £250.
Derby, Derbyshire Royal Infirmary.—H.P. £150.
Gravesend and North Kent Hospital.—Jun. H.S. £80 to £200.
Guy's Hospital Dental School, S.E.—Director of the Dental Prosthetic Laboratory. £600.
Halifax Royal Infirmary.—Third H.S. At rate of £100.
Hamilton County Orthopædic Hospital, Stonehouse.—Res. M.O. £600.
Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—H.S., Cas. M.O. Also Cas. Surg. O. Each at rate of £100.
Hospital for Consumption, &c., Brompton, S.W.—Asst. Res. M.O. £150. Jun. H.P. at Frimley Sanatorium. £100. Also H.P. £50 for six months.
Huddersfield Royal Infirmary.—Jun. H.S. £150.
Hull Royal Infirmary.—Hon. Phys.
Isleworth, Warkworth House Institution, &c.—Res. Asst. Med. Supt.
Leicester Royal Infirmary.—Two Surg. Dressers. 10*s.* 6*d.* weekly.
Liverpool City.—Asst. City Bacteriologist. £600.
Liverpool Heart Hospital.—Hon. Asst. Phys.
London Female Lock Hospital, 283, Harrow-road, W.—H.S. At rate of £150.
Manchester, Ancoats Hospital.—Res. Surg. O. £200.
Manchester Hospital for Consumption, &c.—Hon. Asst. Anæsthetist.

Manchester, Salford Royal Hospital.—Res. Surg. O. At rate of £200.

Manchester, Victoria Memorial Jewish Hospital, Cheetham.—Jun. H.S. At rate of £125.

Metropolitan Hospital, Kingsland-road, E.—Sen. H.P. and H.S., Jun. H.P. and H.S. Also two Cas. O.'s. Each at rate of £100.

Miller General Hospital, Greenwich-road, S.E.—Cas. O. £150.

Newcastle-upon-Tyne, University of Durham College of Medicine.—Asst. in Public Health Labs., &c. £350–£450.

New Delhi, India, Lady Hardinge Medical College.—Prof. of Anatomy. Rs. 750 a month.

Northampton Education Committee.—Asst. School Dentist. £450.

Norwich, Norfolk and Norwich Hospital.—H.P. £120.

Nottingham, Bagthorpe Institution and Infirmary.—Res. Asst. M.O. At rate of £300.

Preston, High Carley Sanatorium, near Ulverston.—Asst. Tuber. M.O. £350.

Preston and County of Lancaster, Queen Victoria Royal Infirmary. Hon Asst. S. and Hon. Asst. P.

Prince of Wales's General Hospital, Tottenham, N. — Res. Sen. H.P. Sen. H.S. and Special H.S. Each at rate of £120. Also Jun. H.P. and Jun. H.S. Each at rate of £90.

Queen's Hospital for Children, Hackney-road, E.—Surg. to Ear, Nose and Throat Dept. Cas. O. At rate of £100. Also H.P. At rate of £100.

Reading, Royal Berkshire Hospital.—Med. Reg.

Redhill, Surrey, Royal Earlwood Institution.—Jun. Asst. M.O. At rate of £250.

Romford Union, Oldchurch Hospital.—Res. 2nd Asst. M.O. £250.

Royal Air Force.—Medical Officers.

Royal London Ophthalmic Hospital, City-road, E.C.—Gifford Edmonds Prize in Ophthalmology. £100.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.S. At rate of £100.

St. Andrews Hospital, Devons-road, Bow, E.—Two Asst. M.O.'s. Each £350.

St. John's Hospital, Lewisham, S.E.—Res. M.O. £200. Res. Cas. O. and Jun. H.S. Each at rate of £100.

Saint Mark's Hospital for Cancer, &c., City-road, E.C.—H.S. At rate of £75.

Sheffield Union Hospital, Firvale.—Res. Asst. M.O. £250.

Sunderland Union.—District Medical Officer. £185.

Swansea Hospital.—H.S. £150.

Victoria Hospital for Children, Tite-street, Chelsea, S.W.—Hon. P. or S. for Diseases of the Skin.

Wakefield, Clayton Hospital.—H.S. £150.

Warrington Infirmary and Dispensary.—H.P. £150.

West End Hospital for Nervous Diseases, Welbeck-street, W.—Two Hon. Anæsthetists.

Western Skin Hospital, 44, Hampstead-road, N.W.—Hon. Asst. Dermatologist.

Winchester, Royal Hampshire County Hospital.—Hon. Phys.

The Chief Inspector of Factories announces the following vacant appointment for Certifying Factory Surgeon:—Lytham (Lancs.).

The Secretary of State for the Home Department gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act for the Bradford, Keighley, Skipton, and Settle County Courts. Applications should reach the Private Secretary, Home Office, Whitehall, S.W., not later than April 17th.

Births, Marriages, and Deaths.

BIRTHS.

ANGUS.—On March 27th, at Bewick-road, Gateshead, the wife of Dr. Alan Angus, of a daughter.

BARDSLEY.—On March 27th, at Carlton-road, Putney, the wife of Dr. P. E. Bardsley, of a son.

BENJAMIN.—On March 27th, the wife of Dr. Alva Benjamin, of a daughter.

FETTES.—On March 22nd, at Randolph-crescent, Edinburgh, the wife of Major D. Fettes, R.A.M.C., of a son.

HUBBLE.—On March 23rd, at Derby, the wife of Douglas Hubble, M.B., B.S., of a daughter.

SMITH.—On March 20th, at "Cullingworth," St. Peter's-in Thanet, the wife of R. Wylie Smith, M.B., B.Chir., of a daughter.

SNELL.—On March 28th, at Altrincham, Cheshire, to Evelyn, wife of Norman Snell, M.D.—a son.

MARRIAGES.

MINDE—WILSON.—On March 9th, at Chelsea Register Office, Dr. Max Minde, of Horrsal, Cape Town, and London, to Valerie Frances Somerville Wilson, of Arlington, Johannesburg, South Africa.

DEATHS.

ATKINS.—On March 25th, suddenly, at Chelston Manor, Torquay, Frederick Durnford Atkins, M.B., B.S., M.R.C.S., L.R.C.P.

BURTON.—On March 30th, at St. Giles-street, Norwich, Samuel Herbert Burton, M.B., F.R.C.S. Eng., J.P., aged 75.

HEDDEN.—On March 28th, at South Bank, Bideford, Richard Hedden, M.R.C.S. Eng., L.R.C.P. Lond., L.S.A., aged 68.

HUNT.—On March 22nd, at Maidenhead, Edwin Guy Hunt, M.D., of Erpingham-road, Putney.

STEELE.—On March 25th, at Clifton, Bristol, Lieut.-Colonel W. H. Steele (retired), R.A.M.C.

WHITE.—On Good Friday, Edward Augustine White, M.B., B.S., M.R.C.S., L.R.C.P. Lond., aged 25 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

MANIPULATION OF THE BACK.*

BY JAMES MENNELL, M.D. CAMB.,
SENIOR MEDICAL OFFICER OF THE KENSINGTON CENTRE FOR PHYSICAL TREATMENT, BRITISH RED CROSS SOCIETY.

THE Clinic of the Kensington division of the British Red Cross Society's Centre for Physical Treatment was used originally during the war for the treatment of soldiers. Later on, it became a clinic for the treatment of pensioners. When these services were no longer required, those responsible decided that, if it had held a useful place in the treatment of soldier and pensioner, it might surely do so in the treatment of the civilian populace.

The Kensington Red Cross Centre.

Like other institutions of a similar kind, it opened with a few—literally two—patients. During the seven years of its existence there have been 4180 patients on the books. There has been an average daily attendance of 88 patients for treatment during the last six months, and the average number of new cases received has been 21·15 per week during this period. The clinic has grown in part, of course, through the loyal support of some of the practitioners of the neighbourhood, but for the most part patients come through mouth to mouth recommendation from former patients—though I would emphasise the fact that in no circumstances is anyone treated at this clinic unless he or she brings an introduction from a qualified medical practitioner. Those who are in a position to pay for expert advice and treatment elsewhere are also refused, and at the other end of the scale those who cannot pay the minimum fees without financial inconvenience. The comparatively well-to-do and the ordinary hospital out-patient are thus excluded. Between these two classes there is an enormous mass of the populace who cannot afford fees for private treatment, and yet who would shrink from attending hospital, and it is for the sake of these that the clinic exists, and for those who, but for the facilities we give for evening treatment, would be faced with the choice between going without treatment or going on the "sick-list." At the present time there is a loss of about £1000 a year, every penny of which is raised by the Kensington Division of the British Red Cross Society; and, when it is remembered that the wealth of Kensington is far from what it used to be, the courage of those who have made themselves responsible for the clinic becomes obvious.

Every patient who attends there is treated in every respect as an ordinary private patient. The time for consultations with the physician-in-charge is fixed, and the masseuse then reserves a definite time for the patient to attend for treatment. Every patient is treated in a cubicle and is interviewed in just the same way as would be an ordinary private patient. On alternate months throughout the winter a meeting is held at which some one branch of the professional activities carried on at the clinic is described, and all qualified medical practitioners are welcome to attend these meetings.

Physico-therapy of the Spinal Column.

I realise that many people will consider that I am treading on unhallowed ground when claiming manipulations of the spine as a therapeutic agency. There exists in the lay mind a certain amount of confusion of thought about the back. There is something mysterious about it, doubtless connected with the fact that so important a part of the main central nervous system is situated in this region. It is not easy for the layman to realise the difference between the spinal column and the spinal cord, and I am afraid that the power to differentiate between these two has, to a certain extent, pervaded the ranks of our own profession. The spinal cord is part of the central nervous system: the spinal column is part of the skeletal system. Apart, therefore, from considering the back in terms of the central nervous system, the physicotherapist regards it merely in the light of a series of bones and joints. The joint surfaces are of an extremely complicated nature in many situations, particularly in the upper part of the neck and in the pelvic region.

Everyone is, I think, agreed that the spinal column, in so far as it consists of bone, is liable to all the ills of bone in other parts of the body. For instance, we recognise without surprise, malignant disease, tuberculous disease, osteitis deformans, and other bone diseases, but somehow or another the possibility that the joints in the back should suffer in the same way as joints in any other part of the body seems to have been all too frequently overlooked. For example, we are all of us familiar with, and diagnose without question, a synovitis of the knee following on a severe twist. Surely it is possible that a similar lesion should produce a similar condition in one of the spinal joints, and yet, so far as I am aware, I never yet remember hearing the diagnosis given, or even suggested, in the case of a spinal joint. Moreover, we all know and recognise the pain and disability that adhesions may cause in a shoulder-joint, and we take the utmost care and patience to remedy them; yet if a similar condition occurs in one of the spinal joints, the chances are that the patient will be expected to work off his symptoms, while comparatively few are ready to prescribe the treatment which they would so readily prescribe for the knee—namely, that the adhesions should be broken down by joint manipulation under an anæsthetic.

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* Being the substance of a lecture demonstration on the occasion of the seventh anniversary of the Kensington division of the British Red Cross Society's Centre for Physical Treatment.

The whole situation seems to me to be irrational. If once we admit that the spinal column consists of bones and joints, we must admit that these joints are liable to ordinary strains of accident; and, if we once admit this, we must admit also the essential desirability of making a diagnosis in the first place, and of providing suitable and adequate treatment in the second. We all know how utterly and totally impossible it is to remedy certain cases of stiff shoulder or stiff knee, except by manipulation. So, too, there are countless cases of back trouble where manipulation alone offers a chance of relief, and the tragedy is that no other treatment can possibly be of any avail.

Where a joint is concerned there are only three things which it is possible to do with it. One is to fix it, the second is to move it, and the third course lies between these two—namely, to limit the movement of the joint by support. True, a great deal can be done, by encouraging muscle action, to build up the strength of the muscles which control the movement of joints: but those of you who have tried to build up the strength of a quadriceps which controls a knee, in which full extension cannot be obtained, know only too well the futility of the attempt. Similarly, it is irrational to suppose that, if there is a painful limitation of movement of a joint in the back, the patient of his own volition is able to build up once more the strength of the muscles which control that joint.

The Locking of Joints.

Now we come on to much more delicate ground, and this involves the question as to whether it is possible for a joint to lock or not. I think that few of us who devote any great part of our professional life to the treatment of injuries will fail to accept the fact that locking, to a greater or less degree, can take place in many joints. One of the classical examples is recognised—the case of the "pulled elbow," in which the radius is pulled downwards in the long axis of the forearm, until either the superior or inferior radio-ulnar joints become partially locked. The treatment, of course, is simple, and consists of pushing the radius up again, and this is one of the "five-minute miracle cures" which so delight the heart of the unqualified practitioner of joint manipulation. The same applies to wrist injuries at games like tennis or golf, and more rarely to one of the conditions which are so commonly classed under the generic term of "tennis-elbow." Frequently the most disabling conditions in elbow or wrist, so far as the continued practice of the game in question is concerned, can be relieved instantaneously by manipulation. If the lesion is seen in the early stages, it is quite impossible that adhesions should have formed, and when manipulation cures in these early stages it cannot be due to the breaking down of adhesions. There is no demonstrable dislocation either clinically or on X ray examination, and we can therefore only conclude that, in these cases of recent injury in which manipulation is immediately successful in restoring painless movement, the condition must have been due to a locking of two joint surfaces, and that this locking is freed by the manipulation. If this applies to the joints of the extremities, a most casual glance at, shall we say, the lumbo-sacral junction will serve to show how far more likely is this locking to occur in this situation than in many of the joints of the extremities. This frequently accounts for that endless tale of patients who suffer from backache and, having failed to secure relief through the more recognised channels, have been driven to consult the bone-setter or the osteopath, and have received almost, if not quite, immediate relief.

I do not mean to say that all cases of backache can be relieved by manipulation. The only point I wish to stress is this, that we cannot wilfully blind ourselves and deny that cases do exist in which the symptom of pain in the back is cured by manipulation; and if these do exist, it is our duty to try to distinguish these cases, and to prescribe the only treatment which can possibly be of benefit. Since the war, many discussions have been held upon backache due to various lesions or conditions in the region of the sacro-iliac joint, or of the lumbo-sacral junction. In America the literature on these subjects is voluminous. Quite irrationally, however, as it seems to me, the possibility of trouble arising from acute or chronic conditions in the joints higher up in the back has been entirely ignored.

Take, for example, cases of spasmodic torticollis in the adult—that terribly distressing condition which one usually only encounters in those of advancing years. Life to these poor sufferers is rendered wellnigh intolerable, and the only thought that they have to comfort them is that life itself cannot continue very much longer. On more than one occasion I have been allowed by the patient to manipulate the neck under a general anæsthetic, simply because there was, in the patient's mind, the distinct hope that the operation would have a fatal termination. Yet I have never manipulated the cervical spine without earning the gratitude of the patient, and this in spite of the fact that cure has sometimes been impossible, and that I have only been able to secure a degree of alleviation.

It is now a recognised thing among a few medical men to prescribe mobilisation under a general anæsthetic as routine treatment for patients suffering from certain types of pain in the lower part of the back; yet there must be at least as great a number of people who drag on day after day in misery merely for lack of similar treatment for the cervical spine. What is true of the cervical spine is true only in lesser degree of the joints throughout the back.

Rest and Mobilisation.

One of the great difficulties in treating cases of recent injury of the back is to secure adequate rest from strain. In the lumbar region, for instance, complete rest is nearly impossible, except on a plaster bed. It is true that, with the knees drawn up over a pillow, a certain amount of relief can be secured; but if the pillow is a shade too high or a shade too low some element of strain must creep in. All of us are probably aware of the waywardness of a pillow, and the impossibility of maintaining accurate adjustment for any length of time. Moreover, this degree of rest can only be secured while the patient is on his back. Any attempt to lie on the side must inevitably disturb complete rest to some degree

Few of us would expect a synovitis of the knee to clear up with any rapidity if the joint was allowed to exercise the weight-bearing function. Surely, then, it is not surprising when we realise the immense difficulties of preventing lumbar or sacro-iliac joints from bearing weight, that these joints fail to recover rapidly from a similar condition.

It is little wonder that many of these cases of back strain develop adhesions; and, as we know from our experience with other joints, if adhesions are present the correct treatment is by mobilisation. Few of us would imagine that we should be likely to restore a patient whose trouble is due to adhesions in the knee-joint by ionisation, radiant heat, diathermy, massage, or indeed by any treatment other than manipulation. Is it rational to suppose that what it is impossible to effect in the knee-joint we should succeed in performing in one of the joints of the back

The possibility of pain radiating into more distant parts because one of these joints is at fault must be considered. We know, for example, that if a patient comes to us complaining of pain in the knee, and on examination we were unable to discover any sign in the knee itself to account for the symptoms, we promptly examine the hip, and we recognise that pain in the knee is often the first sign of some form of disease of the hip-joint. Why, then, should we fail to realise that pain may be set up in some more distant part as a direct result of a lesion of one of the joints of the spine? Many people now realise the possibility of pain being referred down the leg as a result of a lesion of the sacro-iliac joint, but comparatively few are ready to believe in a traumatic origin—for example, of pleurodynia. Anyone, however, who has experienced the dramatic cure of cases of this type as the result of manipulation must, I think inevitably become a firm believer in the possibility of a locking of a costo-vertebral joint as a cause of most acute symptoms. Yet is it comparatively rare for us to recognise as a cause, shall we say, of brachial neuritis, some corresponding lesion of one of the cervical joints.

I well remember one case which gave me a very useful lesson on the possibility of the occurrence of referred pain as a result of trouble in the upper cervical spine. A young boy had a mild attack of influenza, and for some reason, quite unknown, woke up one morning completely unable to bend his head forwards. On palpation and on manipulation there was definite pain between the third and fourth cervical vertebræ. I was totally unable for a time to account for the fact that there was a considerable amount of pain and discomfort in the neighbourhood of the lower ribs on the same side as the pain was felt in the neck, yet it seemed apparent that the simultaneous origin of the two symptoms must have some common factor. It was only when I remembered the possibility of irritation of the phrenic that I was able to establish the connexion between the two.

Occipital headache, too, is frequently due directly to stiffness in the cervical spine, and can often be relieved almost, if not quite, by manipulation alone. The same may be said of pain throughout the distribution of the branches of the superficial cervical plexus, and we have just witnessed a striking example at this clinic. For over nine months one of our patients had had such severe pain in the side of the face (via the cerviculo-temporal nerve) that she had uninterruptedly worn a thick black velvet shield. Manipulation under ether immediately secured entire relief.

As we descend further down, we may find the pain radiating into the arms. In the thoracic region the nerves of the chest wall may be affected. There is one particular type of this pain to which special attention may be drawn since it is a symptom which earns, for him who can remove it, intense gratitude.

Typical Cases.

Most of us have had women patients who come complaining of pain in the breast, in an agony of fear lest this should be the first sign of cancer. On examination of the breast nothing abnormal is to be discovered, and reassurance is given. When the pain persists, the patient naturally becomes filled with the grave doubts, usually imagining that even if cancer is not already present, the pain must be due to the imminent onset of the disease. Frequently the whole thing can be cleared up in a short time as the result of manipulation.

This circumstance affords an example of the type of case which leaves little cause for wonder that some of the poorly trained and ignorant manipulators claim to be able to cure cancer in the breast as a result of manipulative treatment. The patient believes firmly that this is the only possible cause of the pain; and, when relief follows treatment, both patient and manipulator are readily deceived into thinking that another case of cancer has been cured.

Many unjustifiable claims of having succeeded in curing a patient of indigestion have a similar origin. The low intercostal nerves supply the abdominal wall. Many people, and not perhaps particularly laymen, are liable to attribute pain and tenderness in the epigastric region solely to indigestion. Yet pain will inevitably be felt in this region if there is any condition present at the lumbo-thoracic junction which causes irritation of the twelfth thoracic nerve. The patient, as a rule, has diagnosed his own case as being due to indigestion; only too often this opinion has been backed up by his medical adviser. When no relief is derived from the usual remedies, resource is had to the manipulator; and if, as so often happens, relief is secured, surely both patient and osteopath have some excuse at any rate for claiming that the indigestion was cured by the manipulation. The relief has, of course, followed, not the cure of indigestion, but only the cure of a nerve irritation.

I well know the difficulty of trying the convince a patient who has suffered in this way that I have not succeeded in curing him of indigestion. Personally, I stoutly repudiate the claim, believing that all I have done is to give relief from a pain which the patient has, quite wrongly, attributed to indigestion.

It is doubtless also a similar reason that accounts for the alleged cure of many cases of acute appendicitis by manipulation. We must always remember that McBurney's point is situated half-way down the line drawn from the umbilicus to the anterior superior spine of the ilium. It is seldom recognised that Bear's sacro-iliac point is situated two inches down this line from the umbilicus, and that therefore these two diagnostic points are often separated only by an inch or so. Pain and tenderness in the right iliac fossa is by no means confined to appendicitis. Local tenderness, reflex contraction of the abdominal muscle on pressure, and the posture of the thigh (semi-flexed) are symptoms which may be caused either by a traumatic lesion of the sacro-iliac joint or by appendicitis. In the former condition, however, there is no rise in temperature, little, if any, quickening of the pulse, and, above all, no typical alteration of facial expression; but acute tenderness is felt over the ligaments of the joint when pressure is exerted from behind, a tenderness which is absent in cases of appendicitis.

When we take all these facts into consideration we can readily understand the reason why pain in the right iliac fossa is so often not relieved by removal of the appendix, and we can also, I think, realise that pain in the left iliac fossa need not of necessity be attributed to the ovary.

In this connexion, too, it is only right to refer to the diagnosis so frequently made of lumbago or sciatica. In a clinic such as this, case after case comes to us, week after week, labelled lumbago or sciatica; but here we have grown to regard these names as nearly meaningless. All we infer from the diagnosis is that the patient has pain in the back or leg, and that it is "up to us" to discover the cause. It would be no exaggeration to say, of a hundred consecutive cases sent to us as suffering from sciatica, not more than one or two owe their symptoms to a true sciatica; the remainder are cases of referred sciatica, if indeed the pain involves the distribution of the sciatic nerve at all.

Conclusion.

Let us try to summarise the lesson to be learned by the working of such a clinic as this, with the experience of seven years of uninterrupted work behind us. The first and foremost is, I think, that the medical profession as a whole must review their attitude to the spinal column. It should no longer be regarded merely as the bony home of the spinal cord. We must learn to realise that it consists of bones and joints; that those joints are complicated, and that their mechanism is extremely intricate. Then, too, we must realise that, if these joints exist, they must of necessity be subject to the same ills as are other joints throughout the body, and that they should therefore receive the same scientific consideration and treatment that has been applied to the joints of the extremities. If we recognise and accept the fact that any joint of the extremities can cause symptoms which require manipulation for their relief, we must admit that the same applies to the joints of the spinal column, and no longer withhold from our patients the benefit which manipulation—and manipulation alone—can bestow upon them.

FINGER-PRINTS.

A NEW edition of Sir E. R. Henry's "Classification and Uses of Finger-Prints," which has been issued by H.M. Stationery Office (pp. 142, 3*s.*), brings the total of issues up to six since this useful book was first published in 1900. For those who are engaged in the identification of finger-prints it should be studied in conjunction with the smaller book, "Instructions in the Method of Taking Finger-Prints," also published by H.M. Stationery Office. We learn that on account of its effectiveness, simplicity of working, certainty, and inexpensiveness, the system has now been adopted by practically all civilised States, as is shown by a table of figures compiled at New Scotland Yard. Mr. Charles S. Collins, formerly superintendent of the Finger-Print Branch of the Criminal Record Office, has added an interesting note explaining the method adopted in London. Finger-prints are serviceable not only for identification in criminal cases, but for authentication of certificates of health in the Far East and for the registration of native and Chinese labour. It is now 50 years since Dr. Henry Faulds, who has a good claim to be regarded as the inventor of the finger-print system of investigation, issued a schedule containing outlines of the ten fingers to be filled in with imprints from the palmar pads of each last joint in the serial order of the fingers. These forms were done on copper-plate in Japan, where he was in charge of Tsukiji Hospital, and were circulated freely to explorers, missionaries, ship surgeons, coroners, magistrates, judges, and chief constables. Dr. Faulds's idea was to lay the foundation of a scientific system of personal identification. He intended the records to include soldiers and sailors, in view of the possibility of sudden death and burial without identification, to help in the recovery of lost children, to secure recognition of unknown dead bodies, and of persons who had lost knowledge of their personality by illness. In 1905 Dr. Faulds published a "Guide to Finger-Print Investigation," in which he emphasised his feeling that evidence of this kind can only be kept free from fallacy if submitted to the scientific expert. This guide has long been out of print, and it is Dr. Faulds's earnest wish not to leave the scene before he has been able to issue an expanded and amended edition of the book.

A RECORD OF PHRENOLOGY.[1]

Mr. J. Millott Severn has published privately the story of his life, incorporating his experences as a phrenologist, and it appears fittingly in the centenary year of the demise of Francis Joseph Gall, who is generally accepted as the founder of the cult. The biography gives an interesting description of the life of the author as a child hand on a farm, as a pit-boy, and as a joiner, before the actual experiences of a working phrenologist are reached. These experiences are in many ways quite interesting, while the chapter on the founders of phrenology may be of service to the medical historian. Modern medicine would not, of course, form the same estimate of the importance of phrenology that its followers claim, but there is no doubt that a hundred years ago many medical men believed in the doctrines of Gall and John Gaspar Spurzheim, and that the ideas which they fostered have taken a more scientific aspect with the development of medicine. Those who are sceptical on this point may be referred to early issues of THE LANCET.

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[1] The Life Story and Experiences of a Phrenologist. Brighton Phrenological and Mental Science Institution, 68 and 69, West-street, Brighton. Over 500 pages; 50 chapters; 30 illustrations. 12*s.* 6*d.*

MEDIÆVAL WILLS.

ON Dec. 8th, 1784, Samuel Johnson made his last will and testament. A codicil was added next day, in which he left "to Dr. Heberden, Dr. Brocklesby, Dr. Butter, Mr. Cruickshank, the surgeon who attended me, Mr. Holder, my apothecary, and others, each a book at their election, to keep as a token of remembrance." The book that was chosen by Cruickshank was Clarke's edition of Homer. Johnson did not treat his books very kindly, and it is said that Garrick disliked lending him any of his books as they were returned with marginal notes and often in a dog's-eared condition by the great lexicographer. Such marginal notes would add much to the value of any book to-day.

The will of Matthew Hutton, Archbishop of York, made in 1605, contains the following bequest: "Item. I gyve to my ancient good friend, Mr. Christopher Myller, Physician, Paradox Medicorum, set forth by Fuchius." The work in question was by Leonhard Fuchs (1501–1566), and its full title is as follows: "Paradoxorum medicinae libri tres, in quibus sane multa a nemine hactenus prodita, Arabum aetatisque nostrae medicorum errata non tantum indicantur, sed et probatissimorum autorum scriptis firmissimisque rationibus ac argumentis confutantur. Obiter denique hic Sebastiano Montuo medico Rivoriensi respondetur, ejusque annotatiunculae velut omnium frigidissimae procsus explodentur." This work was published in folio in 1535 at Basle. Twenty years later two editions were published in duodecimo at Paris. Copies of the 1555 editions are in the library of the Royal College of Surgeons of England and in that of the Medical Society.

In 1585 Thomas Tobie, of Newcastle, barber-surgeon, made his will. In it occurs the following bequest: "I geve my son George Tobie to my frend Rauffe Tate, with the booke of Marters, the Erball, Johannis de Vigo, Bullin's booke, with a metall pott and a bason." Of these books, the marters is John Fox's "Acts and Monuments of these Latter and Perillous Days," &c. (London, First edition, 1562); the Erball is possibly William Turner's Herbal, printed at Cologne in 1568, in folio; John of Vigo's "Works of Chirurgerye," was translated by Bartholomew Traheron, London, 1543, in folio; while Bullin's booke is either William Bullein's "Government of Healthe," London, 1558, or his "Bulwarke of Defence against all Sickness, Sornes and Woundes that dooe daily assaulte Mankinde," London, 1562. Another barber-surgeon, of Newcastle, George Fuister by name, made his will in 1592 and among other bequests left, "to my nurse, 2*s.* 6*d.*"

Few save those who have studied the matter can form any idea of the interest, and, indeed, the amusement, that can be derived from a perusal of a mediæval will. These wills were religious documents and were proved in the ecclesiastical courts. In pre-Conquest days wills were made verbally and if reduced later to writing were of a noncupative character; but by the twelfth century it had become usual to record the will in writing, and this was essential if there was any question of a legacy of land, though people were left free to make a verbal disposition of their chattels, if they so desired, until comparatively recent times.

In mediæval times the parish priest had to be present to hear the confession, usually spoken of as the last words, or "novissima verba." From the eleventh to the thirteenth century there was a horror of intestacy amounting to positive dread; it being held that a man dying intestate died unconfessed, and was therefore unfit for burial in consecrated ground. So great was this horror that the stock phrase, "nolens decedere intestatus" is constantly cropping up in the opening sentences of many wills of the period. Another stock phrase, "quia nichil certius morte, nichil incertius hora mortis," which we owe to Bracton, obviously alludes to the uncertainty of life. In the register of John de Peckham, Archbishop of Canterbury, 1279–92, will be found an account of a man who was attacked by robbers and was found by neighbours at death's door; he died before a priest could be brought to him and was buried in the high road. Peckham took a merciful view of the case: "It is said that the poor wretch asked for a priest, if this can be proved, let his body be exhumed and buried in Christian fashion, for he did what he could towards making a testament." This would seem to have been the beginning of an attempt by men to discriminate between the case of a man dying suddenly by accident or disease, "subita et inpreparata morte," and the person, who, lying sick, obstinately refused to utter his last words, and died "desperate" as the saying was.

At this early date it was considered unlucky to make a will when in good health, and in most cases a very short time elapses between the signing of a will and its probation, rarely more than a few weeks elapse and occasionally only a few days. In times of epidemics, such as the plague, men were evidently influenced by fear of imminent peril. In this respect Canon Foster, in his introduction to the magnificent collection of Lincoln wills (Lincoln Record Society, Lincoln Wills, vol. ii., 1918), to which we are much indebted for most of our knowledge of the subject, instances the following: "Of a hole mynde and perfyte remembraunce, preventyng by the grace of God the incerten stroke of dethe and the sodan knockyng and flagicion of Allmighty God, now beyinge in good helthe makyth my last will and mynde."

After having commented on the uncertainty of life the mediæval testator proceeds to leave his soul to the Almighty and his body to the earth whence it came. The church is almost always mentioned and much money is usually directed to be spent by his executors, that to be spent on wax for candles being usually specified. Before making any other bequests he mentions his mortuary, called in old wills the "principalium." This mortuary, or soul-scot, was a sort of religious heriot allowed by custom to the priest of the testator's parish; it usually took the shape of his best beast or best garment. Selden says that the mortuary was for tithes forgotten, a sort of death bed restitution, like conscience money to the Chancellor of the Exchequer; though this may have been so in some cases, one can find in any collection of old wills numerous examples of money left to the altar of the church for tithes forgotten as well as the mortuary. When we get to the body of the will we find the most entertaining bequests of the goods of the departed, and the reader is often set a pretty puzzle to understand what some of the articles were.

In reference to the dread of dying without making a will, the saying may be recalled of one of the old monkish chroniclers (? Symeon, of Durham), who in recording the death of some man, says that he died in the night and was found by his servants next morning, dead, black, stinking, and intestate!

THE MELANCHOLIA OF SEMMELWEIS.

IN his Semmelweis Cup speech delivered at the annual conference of the Budapest Medical Club Prof. Rezső Bálint discussed the causes of Semmelweis's melancholia which, as is well known, led to his admission to an asylum in 1865 at the age of 47. We often read, he said, even in modern medical literature, that Semmelweis suffered acute distress of mind owing to lack of understanding or misjudgment of his doctrines on the part of his contemporaries, and that throughout his life he felt himself to be persecuted by an inexorable fate. But Semmelweis was not the only man who had to bear this misfortune; many a man of genius, who has sought to divert or accelerate the ordered progress of culture by some unexpected act or discovery, has shared his fate. It has happened not uncommonly in the history of science and the arts that a few individuals of commanding genius have risen high above the level of their contemporaries, and that many years have passed before a later generation has attained the horizon of their outlook, and learned to understand and appreciate them. Brandes says in his book on Goethe that the cultural development of a period, or of a nation, can be measured by the degree of comprehension it shows for the spirit of Goethe—as Auerbach puts it, how "Goethe-ripe" it is.

But the failure to understand and recognise the value of Semmelweis's work was a far more serious matter than the inability to appreciate Goethe's poetry. If a man is unable to enjoy Goethe his loss is spiritual only, but the failure of contemporary scientists to comprehend Semmelweis's theory, and their refusal to put it to a practical test, sacrificed the lives of thousands. And yet how simple was the truth which he proclaimed, how much more difficult and confused the lines of thought on which his opponents sought for a solution of the problem—the discovery of the cause of puerperal fever. Telluric, atmospheric, cosmic changes, psychic influences, and other factors difficult of analysis distracted their minds, and the simple truth which flashed upon Semmelweis in all its splendour when he compared the death-rates of the two sections of the Viennese Obstetrical Clinic made no appeal to them. The very fact that the doctrines found access with difficulty to the minds of his contemporaries is proof of their magnificence. What freedom from prejudice, from bondage to accepted doctrines, what intellectual daring it required to recognise so revolutionary a truth and champion it with zeal against all assailants! In his open letter to Spaeth, Semmelweis wrote: "You also take part in this slaughter, Professor! But the killing of women wholesale must be stopped, and I myself will stand sentinel. Anyone daring to proclaim dangerous doctrines about puerperal fever will find in me a doughty opponent." The fact that his theory was not recognised caused him pain, not from vanity, but because he knew that its non-acceptance was costing many a mother her life. This painful consciousness perturbed and depressed him, but could not diminish the happiness of the knowledge that a new truth, to which thousands would owe their lives, had originated in his brain.

It cannot be true, said Prof. Bálint, that great souls are made unhappy by the failure of the world to understand them. Man may strive in all his thoughts and acts to attain contentment, but true happiness is experienced only by those who find it in themselves.

> Erquickung hast du nicht gewonnen,
> Wenn sie dir nicht aus eigner Seele quillt.

Are we justified in assuming, from the sullenness of Beethoven's face, from the gloomy utterances in which he indulged, that this great soul was unhappy? Does not the Ninth Symphony resound with joy? Is there one of his works that is not dominated by gaiety? Surely Beethoven could not have composed music that was not a reflection of his own feelings. Great souls like these, confronted with human ill-will or uncomprehension, find these but trifling vexations in comparison with the supreme contentment that dominates their souls. Can we imagine that Semmelweis would have sacrificed this great truth to win the applause of his contemporaries?

VITAMIN C IN LIVER.

THE use of liver and liver extracts in the treatment of pernicious anæmia has led to the study of these substances as a therapeutic agent in other disorders. In the nutritional diseases of infancy and childhood some observers claim excellent results with various forms of liver diet. That liver contains fat-soluble vitamin is, of course, well known, but a certain amount of research has also been undertaken upon its antiscorbutic value, dependent on the presence of vitamin C. H. Aron, H. Hirsch-Kauffmann, and E. Schädrich[1] have conducted experiments on guinea-pigs, using as a control basis a scurvy-producing diet consisting of 20 g. of sterilised oats and 30 g. of sterilised milk daily. In three animals this produced in about three weeks typical scorbutic collections of blood in the neighbourhood of the ends of the long bones and these changes could be demonstrated by the X rays. In a fourth animal a portion of the oats was replaced by pulped liver so that the protein intake was the same as in the control animals. This form of liver was, however, not relished by the animal and failed to prevent the appearance of scurvy. Consequently it was decided to employ a water extract of fresh liver and this was prepared by pounding 60 g. of liver pulp with 60 c.cm of water in a mortar and allowing it to stand in an ice-chest for 24 hours. The mixture was then filtered and a somewhat cloudy, bright red filtrate obtained.

About 5 to 6 c.cm. of this liver juice appeared to be equivalent to 7·5 g. of fresh ox liver, and daily administration of this amount of liver prevented scurvy in guinea-pigs fed on the scorbutic diet mentioned above. On testing the thermostability of the liver extract it was found that heating for five minutes in a boiling water-bath considerably altered its colour and consistency, but left its antiscorbutic power unaffected. Alcoholic extracts of fresh liver, the residue of these extraction processes, and a preparation called "hepatrat" were found to have no antiscorbutic power such as the simple water extract had shown.

These studies are interesting as indicating how the vitamin C content of liver may best be obtained for therapeutic purposes. So far as infantile scurvy is concerned a new antiscorbutic preparation is hardly wanted, since cases can readily be cured with fresh fruit juice, unboiled milk, and such substances as "potato cream." It is possible, however, that some infants would tolerate a water extract of liver better than fruit juice as a prophylactic agent.

THE GUARDIANSHIP SOCIETY.

THE work of the Guardianship Society, which has its headquarters at Brighton, was described in the sixteenth annual report presented on March 23rd. The object of the Society is the care and supervision of the mentally and physically defective, and other special cases, and during 1928 no fewer than 876 persons were under care, while another 70 cases had been visited voluntarily in their homes and otherwise helped, bringing the total number of persons assisted or supervised to 946. This figure does not include after-care patients, in which category there were 225 on the register at the end of the year, *an increase of* 88 in the 12 months. The persons under care may be classified as follows:—

Certified under Mental Deficiency Act	425
In a "*place of safety*"	3
Notified under Section 51	90
Under single care under the Lunacy Act	9
Physical defectives and others boarded-out	260
Under statutory supervision in their own homes ..	89
Total	876

The Society's clinic for nervous disorders has been open now for three years, and 48 sessions were held in 1928, 102 patients (45 male, 57 female) being treated. The Society has two homes in the country—at Dungates, and Jarvis Brook, Sussex—and at the latter place another home has been started where backward boys, and a certain number of lads on licence, are trained in gardening, and rabbit and pig breeding. There are two industrial class centres—one in Brighton and one in Hove—and there is also a special school for defective children in Hove. Interest and financial help is urgently needed for the furtherance of this work among the mentally and physically defective. At the annual meeting a high tribute was paid to the work of the hon. secretary, Miss Grace Woodhead, under whose guidance the administrative expenses are only 3¼ per cent.

Dr. Crichton Miller addressed the meeting on the Duty *of Society towards the Subnormal Child. He pointed out* that instead of the ordinary problem of educating the individual so that he might adjust himself to his environment the Society were faced with that of devising an environment suited to the individual.

THE PANEL SYSTEM IN BIG TOWNS.

To the Editor of THE LANCET.

SIR,—With regard to the letter of "Aggrieved" in your issue of Feb. 23rd (p. 420) which has just been brought to my notice, I feel that, both as a panel practitioner and one of those requested to attend by "Aggrieved," I should like to answer. The charge against the panel practitioner is that he "may reap the fees while other doctors do the work." This is due to a misconception on the part of "Aggrieved." No medical man reaps fees on account of maids who are on no one's panel list. "Aggrieved" does not realise that insurance work is contract work. One agrees to attend at all times patients on one's panel, and other insured patients in emergency, whether on one's panel or not. There was no obligation to attend "Aggrieved's" maid on either of these counts. A case of influenza in the house of a doctor is scarcely an emergency.

In addition, I should like to remind "Aggrieved" that the request from an employer to take his maids on to one's panel, with the proviso that he would pay for the first visit as a private one, is always insulting, and doubly so in the case of one doctor to another. As regards difficulty in getting drugs dispensed at certain hours, this of course exists, and is usually well met by giving domestic remedies. Were no aperients, no aspirin present in "Aggrieved's" own house?

I am, Sir, yours faithfully,
PANEL PRACTITIONER.

Pimlico-road, S.W., March 28th, 1929.

THE PUBLIC SCHOOLS YEAR BOOK.

THIS year book, which is the official book of reference of the Headmasters' Conference, now appears for the fortieth time (London: H. F. W. Deane and Sons. Price 10*s.* 6*d.*) It contains a list of the public secondary schools represented on the Conference and the Editors have spared no efforts in making the information accurate and complete. Parents will be interested in the sections dealing with the entry to the services, professions, and various business careers. Scholarships given in aid of medical study are set out at length in a table of 26 pages in a most serviceable way. There is an alphabetical list of old and new works of reference concerning schools and colleges or their historical memorials, lives of headmasters, school registers, magazines, and so forth. For instance, the reader is referred to "Our Schools and Colleges" by Captain Frederick Shirley de Carteret-Bisson, the fourth edition of which was published in January, 1879. This book, now out of print, was a veritable mine of educational information in *the seventies. Details of public* schools outside the Headmasters' Conference are not included in the year book, the conditions under which a school may be represented being briefly stated in the preface. Parents, schoolmasters, and boys will all find interesting information and records in the book.

"TRANSPULMIN" IN TUBERCULOSIS.

Harlan F. Newton and Kurt Heine[1] report beneficial results from the intramuscular injection of transpulmin. This is a sterile solution of basic quinine and camphor in ether oils. Quinine accumulates in the lungs and together with the ether oils is said to exert an antisecretory effect upon the mucous membranes of the lung tubes. The success attending the use of transpulmin in chronic bronchitis, pulmonary abscess, and bronchiectasis led the authors to try its effect on 40 cases of pulmonary tuberculosis. The selected cases were of the productive and cirrhotic types, acute infections and those of the cavernous type being excluded as unsuitable. Treatment was continued daily for three to five weeks. Favourable effects were noted in 28 patients, cough was relieved, fever diminished, expectoration reduced, and tubercle bacilli banished from the sputum in all but two of the cases. No ill-effects were noted, while decrease in physical signs and improvement in the X ray picture resulted.

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[1] Jahrb. f. Kinderheilk., 1929, cxxiii., 1.

[1] Amer. Rev. of Tuberc., 1928, xviii., 563.

Goulstonian Lectures

ON

POLYURIA

Delivered before the Royal College of Physicians of London

By ERNEST BASIL VERNEY, M.B. Camb.,
F.R.C.P. Lond.,
PROFESSOR OF PHARMACOLOGY IN THE UNIVERSITY OF LONDON, UNIVERSITY COLLEGE.

Lecture III.*—POLYURIA IN CHRONIC NEPHRITIS.

(Delivered on March 14th.)

Mr. President and Fellows,—In the first lecture emphasis was laid on the dependence of the kidney for its physiological conduct, in so far as its rapid and purposive response to an increased load of water in the tissues is concerned, on the secretory activity of the pituitary body. Such dependence may—we do not know—represent one aspect only of a fuller reliance by the kidney on the metabolic activities of the endocrine glands. But this much is clear—viz., that the water elimination by the normal kidney is profoundly influenced by the content of the blood in the secretory product of the pituitary gland. And, in that both when the secretion of the pituitary body is impaired by experimental interference and by the incursions of disease, the physiological background of the kidney must itself be sufficiently reactive in order that the typical response to the lowering of the pituitrin content of the blood may be made manifest, it is not surprising that there is close agreement between the findings of pathology and those of experimental physiology.

The interpretation of the polyuria which is seen to accompany certain forms of chronic nephritis seems in the present state of knowledge to be a much more difficult problem, and one feels acutely that anything one has to say on the subject is necessarily disjointed and speculative. But it may not be entirely without value if the clinical and pathological facts, as generally accepted at the present time, are first described, and then, in the light of our present knowledge of the physiology of the kidney and of the cardiovascular system, an attempt made to form some conception of the mechanisms responsible for the exhibition of these facts.

Polyuria is typically associated with those structural changes which are found in the so-called contracted white kidney. The glomeruli are extensively and unequally damaged, and show varying degrees of patency in the capillary loops. The tubules exhibit marked signs of degenerative changes, these changes being perhaps dependent on the degree of glomerular damage (Löhlein [8]). The structure of the kidney is extensively altered, depending partly on the destruction of the specific parenchyma, partly on regenerative processes. Polyuria, especially nocturnal polyuria, is often the first symptom of the disease, but "no close parallelism exists between the weight of the kidney, its appearance, and the amount of urine it secreted before death" (Osler [11]). And all attempts to correlate the degrees of structural change with the functional responses of such kidneys fail. But when the structural changes are intense the polyuria may be said to be obligatory, and raised arterial tension is persistent and extreme. The vasculature of the kidney shows extensive arteriosclerotic changes, but that these changes are secondary to the raised arterial tension is made unlikely by the fact that they may be strictly localised to the kidney or be at least much more extreme in their degree here than elsewhere in the body. The presence of such localised vascular changes in the kidney, associated as they are with high blood pressure, is an argument, as Volhard and Fahr [20] point out, in favour of their being connected as cause and effect. As already mentioned, nocturnal polyuria may be the first symptom of any derangement of renal function, and this may occur in the absence of any sign of a rise in the general blood pressure. On the other hand, high blood pressure is not necessarily associated with polyuria, as is well recognised in the fact that generalised arteriosclerosis, raised arterial tension, and cardiac hypertrophy are commonly encountered without there being any signs or symptoms of impairment in the function of the kidney. In such conditions the amount and colour of the urine may remain normal for many years, and the marked oscillations in the rate of urinary flow during the day, a phenomenon which above all others is to be regarded as a sign of normality in renal function, are as a rule conspicuously present. Quincke's [14] nycturia, it is true, is a symptom which is sometimes evident, but it is by no means invariably so. Tests of renal function, such as the water ingestion test, concentration tests involving the capacity of the kidney to excrete chloride or urea, give results which are commonly within the normal range—facts which are clearly to be associated with the retention of comparatively large amounts of normal renal tissue and with the frequency with which zones of hypertrophied parenchyma are met with. Such cases die not from renal insufficiency, but from causes due immediately to the structural or functional state of the cardiovascular system, whilst those afflicted with the diffuse chronic nephritis with which we are here mainly concerned die in latent or acute uræmia, or are prematurely carried off through the rupture of a cerebral blood-vessel. One pictures the "contracted white kidney" as arising from the continuous action on the kidney of some toxin locally or remotely produced, the "primary contracted kidney" as arising directly from a generalised vascular disease. Forms of kidney disease intermediate between these two main types may be encountered, but I think it would be generally agreed that in their purest forms these two types do exist and that clinically they may be readily recognised and differentiated.

The colour of the urine in the polyuria of chronic nephritis is pale, its specific gravity is low, ranging from 1005 to 1012, and the amount of albumin is variable, sometimes being hardly detectable, at other times abundant. Traces of blood are commonly present. The earliest functional change which can be detected in this progressive disease is the damping down of the normal variations in urinary output during the day. Hedinger and Schlayer [6] introduced a method of testing renal function which was based on this fact. The volume, specific gravity, and chloride content of the urine collected at two-hourly intervals during the day, and of that collected during the whole night, were measured. It was found that whereas in normal people there were wide variations in the figures relating to the specimens collected during the day, in chronic nephritis without œdema the curves showed a marked constancy in level throughout. The volume of urine was larger and such variations in the rate of urine flow as did occur were not reflected in any marked change in specific gravity or chloride content. In more severe cases there is an increase in the volume of the night urine, and when this occurs Hedinger and Schlayer state that there is widespread damage to the kidney parenchyma. But no definite relationship exists between the degree of structural damage to the kidney and its functional response. Mösenthal [10] repeated and extended the observations of Hedinger and Schlayer and made comparative tests of the effects of high and low protein diets in various forms of renal disease. It was found that nocturnal polyuria was much more frequent on the high than on the low diet, and it was concluded that when this symptom occurred with a low protein diet it was to be regarded as a much graver sign of renal insufficiency than when it occurred with a high. The nocturnal polyuria, as Volhard and Fahr [20] conclude, is to be regarded as a compensatory phenomenon.

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* Lectures I. and II. appeared in The Lancet of March 16th and 30th respectively.

When the capacity of the kidney to concentrate some specific substance such as urea or chloride is investigated it is found that such capacity is markedly diminished in severe or protracted forms of the disease, but that in the earlier stages, even when nocturnal polyuria is present, the capacity to deal with these substances may be to all intents and purposes normal. Tests involving the ingestion of a large volume of water and timing its rate of elimination may show a delayed excretion rate at a stage before that at which any marked impairment in the capacity of the kidney to eliminate urea is encountered. Later the incapacity to excrete large volumes of water rapidly ingested is very marked, and the immediate effect may be an actual diminution in the rate of water elimination (Mösenthal [10]). This incapacity to deal with large additional volumes of water is probably not unrelated to the fact that the polyuria of this disease does not respond to the administration of pituitrin (Hart [5c]). In this respect, then, it differs sharply from the polyuria of diabetes insipidus.

Blood analyses show an increase in the urea and in the non-urea non-protein nitrogen, and the value of these findings in forming an estimate of the degree of renal damage is very appreciable. The retention of other substances such as potassium, phosphate and creatinin in the blood of cases of chronic nephritis has also been reported, and reference will later be made to the significance of this retention. The disease may arise as a sequel to chronic parenchymatous nephritis, but quite commonly there is no history of dropsy, and the polyuria may, and quite commonly is, the first symptom of impaired renal function.

We may, then, sum up the clinical and pathological picture of chronic nephritis with polyuria as follows. In the earliest stage of the disease the first sign to be detected is a disappearance of those rapid swings in the rate of urine eliminated during the daytime which characterise health. Such a disappearance is accompanied or quickly followed by an increase in the volume of urine eliminated during the night. The quality of the urine tends towards a fixed and constantly maintained level in so far as its chloride content and specific gravity are concerned. Albumin is, and blood may be present. Water excretion, urea concentration, and chloride concentration tests, as well as the concentration of urea in the blood, may show little variation from the normal, and no rise in blood pressure may be detected.

As the disease progresses the polyuria becomes more marked, and tests for renal efficiency show that the capacity of the kidney to deal with a suddenly imposed load is waning. The amount of albumin and of blood in the urine is variable, and the urea content of the blood slowly goes up. The blood pressure rises and the rise is persistent. Later these signs and symptoms become more severe and death usually ensues from renal failure.

Our task, then, is to attempt to interpret in terms of physiological mechanisms with which we are already familiar, the signs of this disease and the course which it typically follows. The points which must particularly attract our attention are, in addition to the polyuria, the occasional absence of a raised blood pressure in the early stages, the marked and persistent rise which occurs in the later, the presence of albumin and blood in the urine, and the ingravescent fall in the capacity of the kidney to deal with any extra load to which it is subjected. Further, we must attempt to account for the absence of an increased urine flow in cases of essential hypertension and of generalised arteriosclerosis with high blood pressure.

Let us now turn to a consideration of those facts in the experimental physiology and pathology of urine secretion and of the cardiovascular system, which, so far as our present knowledge goes, may be considered to have an important bearing on the mechanisms behind the production of the polyuria and the course of the disease of which it forms so prominent a sign.

The first fact which I should like to emphasise is the enormous number of renal units which are packed together to form the human kidney. If we make a section tangential to the surface of the kidney we find that the medullary rays are represented as circular areas, the labyrinth of the kidney as the tissue intervening between them. If we examine such a section microscopically we find the medullary rays to be formed by the collecting tubules, whilst in the labyrinth immediately in contact with the medullary ray is a zone of convoluted tubules surrounded by a zone of glomeruli. Masses of such lobules are packed together to form the whole cortex. These lobules have been found to be structurally separable by Traut.[18] After maceration of pieces of human kidney tissue in 50 per cent. HCl for 8 to 12 hours he found that the lobules readily fell apart and that their structure could easily be investigated. The whole cortical surface of the lobule was clustered with glomeruli, inside which were packed the convoluted tubules which themselves formed a compact sheath around the cortical collecting ducts. It was possible to determine the number of these lobules in the human kidney, and by counting the number of glomeruli on the surface of several such units the approximate number of glomeruli in the whole kidney became known. This number is $4{\cdot}5 \times 10^6$, so that the normal man is provided with roughly 10 million units each potentially capable of supplying its quota of fully formed urine. That such an enormous number represents a considerable reserve of secretory tissue is indicated by the results of the experiments of Richards [15] and his colleagues.

Richards has shown by direct observation of the glomerular tufts of the frog's kidney that the number of active glomeruli—i.e., those through which a flow of blood is visible—varies continuously, and that the number of active glomeruli in a given field can be increased by injections of diuretic substances and diminished by injections of vasoconstrictor substances. Further, Richards has demonstrated the possibility, under the microscope, of puncturing the capsule of a glomerulus with a fine quartz pipette and of withdrawing by this means fluid from Bowman's space. The fluid flowed up the pipette only so long as blood was observed to pass through the glomerular capillaries. If these were touched with the point of the pipette they contracted down and the flow of fluid ceased. It would seem, then, that the secretory work of a renal unit was dependent on the flow of blood through its glomerulus.

Two results accruing from these experiments are of special interest to us at this juncture—namely, the alternation in the flow of blood through the glomerular tufts, and the cessation of the flow of fluid collected from Bowman's capsule when the blood flow through that glomerulus ceases. Each unit passes through alternate periods of rest and activity, and as we should perhaps expect, these interruptions are not regular in occurrence and do not affect all the glomeruli within a single field at the same time. The number of units is so large that it is possible for the kidney as a whole to function efficiently under normal conditions when each unit composing it works for a fraction only of its time. Such experiments give us a clearer insight into the meaning of the term "reserve of the kidney," since clearly, when increased work is called for, the units simply respond either by increasing their intervals of work at the expense of their intervals of repose, or by increasing the intensity of their work during their active periods. This alternation of activity and rest which the units of the kidney undergo may be looked upon as the concrete representation of its first line of defence against the inroads of disease.

We have already emphasised the dependence of the urine flow on the pressure stimulus. It does not necessarily follow that a rise in general blood pressure causes an increase in urine flow. Stimulation of the splanchnic nerve, for example, inhibits or arrests the flow of urine since the vasa afferentia are constricted and the pressure stimulus withheld from the glomeruli. The seat at which the pressure stimulus becomes effective—viz., the glomerulus—being situated between the vasa afferentia and the vasa efferentia can, by means of a differential dilatation or constriction of these vessels, become exposed theoretically to any blood pressure from zero up to a value approximating to that of the general arterial pressure. This possibility of an enormous variation in glomerular pressure gives to the kidney its second intrinsic line of defence. But whereas in the calling up of its first reserves the composition and quantity of the urine would not necessarily be altered, *immediately the second reserves are called into* play an increased urine flow occurs accompanied by an approach in its composition towards that of the plasma. The degree of this approach is to be regarded as being determined by the "tone" of the individual units just as the degree of dilatation of the heart when subjected to an increased load is dependent upon the efficiency with which the extra work is performed. We saw in the last lecture two illustrations of this mobilisation of the second reserves of the kidney. In Rose Bradford's experiments a polyuria supervened, the degree of the polyuria in the non-fatal cases being roughly proportional to the amount of kidney substance removed.

Attempts to prove the results obtained by Rose Bradford [4] in his experiments on the reduction of the renal tissue have been undertaken by Bainbridge and Beddard,[2] and by Pearce.[15] Bainbridge and Beddard applied Bradford's technique to three cats. With *regard to the effects of such operations on the amount* and concentration of the urine they make the following observations:—

> "Making allowance for variations of diet, we find no evidence that the amount and specific gravity of the urine are necessarily modified by either the first or second operation. Only one cat almost invariably passed abundant quantities of dilute urine after the first operation, the others often passed a concentrated urine. . . . It may be *concluded, therefore, that the increase in quantity and* decrease in concentration of dog's urine after operations on the kidneys is an incidental rather than an essential *result.*"

But even the incidental disclosure of a mechanism may detract in no measure from the importance of the recognition of such mechanism in attempts to interpret the polyuria resulting from disease. In Pearce's experiments which were made on dogs no comments were *made on the volume of the urine, since the* experiments were designed to check Rose Bradford's observations on the influence of the kidney on nitrogenous metabolism. In the two experiments, however, in which it is possible to compare the outputs of water before and after the reduction in renal substance, it is significant that water additional to the usual allowance was given in the post-operative period, and this increased intake was reflected in an increased output of urine and by a fall in its specific gravity. Pilcher [13] ligated successively the branches of the renal arteries in one cat and one dog and did not observe any change in the output of water. Hermann,[7] on the other hand, recorded an increase in the few of his experiments to which reference was made in the last lecture. The acute effects of ligation of part of the arterial supply to the denervated kidney of the intact dog have, as far as I have been able to determine, not yet been fully investigated. It would appear, then, that an increased output of water following the experimental reduction in the amount of functioning tissue is not invariable in the intact animal. But the important point to realise in so far as the pathology of urinary secretion is concerned, would appear to be the fact of the possible occurrence of such polyuria. Disease may discover mechanisms in the cell which, under experimental conditions, are only brought to light by some peculiar combination of circumstances.

In the experiments on the isolated kidney we saw how the functional removal of approximately half the kidney was followed immediately by an increased flow of urine from the part which was still perfused, an increased flow, moreover, which possessed all the attributes of a pressure diuresis. And we suggested, without being committed to the exact mechanism involved, that each part of the kidney was normally exerting an inhibitory influence over the remainder. Further, it was shown that the functioning part of the kidney was now more susceptible to an externally applied stimulus in the form of a rise in the perfusion pressure. In the whole animal, therefore, it would not be surprising to find that when this second reserve of the kidney was exhausted and all the renal units were *receiving the maximum stimulus which under* the circumstances could be given them, and yet were unable to cope with the work thrust upon them, there should be a call for external aid in the form of a rise in the general blood pressure.

We must now discuss the means whereby this can be brought about. In 1889 Rose Bradford [5] undertook an investigation into the innervation of the renal blood-vessels, determining amongst other things the origin and course of the vasoconstrictor fibres and the existence and course of the vasodilator fibres. The effects on the kidney volume and on the blood pressure of stimulating the dorsal and lumbar nerves seriatim were investigated. It was found that "stimulation of the anterior roots or of the entire nerve after division of the posterior root" . . . was "followed by contraction of the kidney and a rise of general blood pressure when any nerve from the sixth dorsal to the second lumbar inclusive was the one selected." Although *the excitation of all these nerves produced contraction* of the kidney and a rise in blood pressure, yet on the whole stimulation of the lower nerves was more efficacious than stimulation of the upper, the greatest contraction of the kidney being caused by stimulation of the eleventh, twelfth, and thirteenth dorsal nerves. Thus the area from which the kidney vessels are supplied is a very extensive one, and, as was pointed out, it was apparently coextensive with that supplying the abdominal vessels. It was now found that when such a nerve as the thirteenth dorsal, which with quick rates of stimulation always gave a renal contraction and a rise of general blood pressure, was excited by means of slow rhythmic break shocks of one per second or even one every two seconds, the kidney underwent marked expansion and no change in blood pressure occurred. "Just as the quick rate of excitation invariably produced contraction of the kidney, so the slow rate produced expansion." "This *renal expansion had a short latent period and the* rate of expansion was slow, considerably slower than the rate of contraction for the same nerve. Like the contraction effect, however, the expansion was of a persistent character, and generally the kidney remained for a variable time more expanded than it was previously to the stimulation." This true active dilatation of the kidney was only to be obtained by the stimulation of such a comparatively restricted series of nerves as the eleventh, twelfth, and thirteenth dorsal, the same series as that for which the most marked renal vasoconstriction was observed when high rates of stimulation were employed. The presence of these dilator fibres was demonstrated in the splanchnic nerves, and no evidence was obtained which militated against the view that the renal vasodilator nerves reached the kidney by the same path as that followed by the renal vasoconstrictor nerves.

So far, then, the existence of efferent vasodilator as well as vasoconstrictor nerves to the kidney had been clearly demonstrated, the nerves leaving the cord in the anterior roots of the lower thoracic nerves, passing thence to the splanchnic and so to the renal plexus. The reflex phenomena of the renal vessels were next investigated, and it was shown that by reflex excitation, be it from the central end of the sciatic or from the central end of an intercostal nerve, it was more common to obtain contraction than expansion of the kidney, but that expansion was frequently obtained by the excitation of a posterior root of a nerve belonging to what may be called the renal area—i.e., eleventh, twelfth, and thirteenth thoracic. I will, if I may, quote from one of Rose Bradford's papers (51):—

> "If a posterior root below the third lumbar nerve be excited, the rise of blood pressure is similar to that seen

on excitation of the great sciatic; if, however, the central end of one of the upper lumbar or lower dorsal posterior roots be excited the rise of blood pressure is far greater in amount and more sudden in its onset; in fact, the effect is quite different to that seen with the lower roots. The anterior roots of these nerves contain, as we have seen, the vasoconstrictor fibres distributed to the vessels of the viscera, and these observations tend to show that these posterior roots also contain special afferent fibres capable of affecting the vasomotor system to a far greater extent than the ordinary afferent fibres seen in sensory nerves. In other words, this great and sudden effect on the blood pressure would tend to show that some posterior roots contain afferent fibres derived probably from the viscera and from the kidney, amongst other viscera. The fact that there are such nerves distributed to the kidney and that the excitation of their central ends is capable of causing a very great effect on the vessels of the body generally, is also a fact that may have some bearing on the production of high tension in certain renal diseases. The other point of interest about these afferent visceral fibres is that, although their excitation causes a rise of blood pressure with general constriction, there is a local dilatation of the kidney—in fact, this is the only method by which, experimentally, any very considerable dilatation of the renal blood-vessels can be produced."

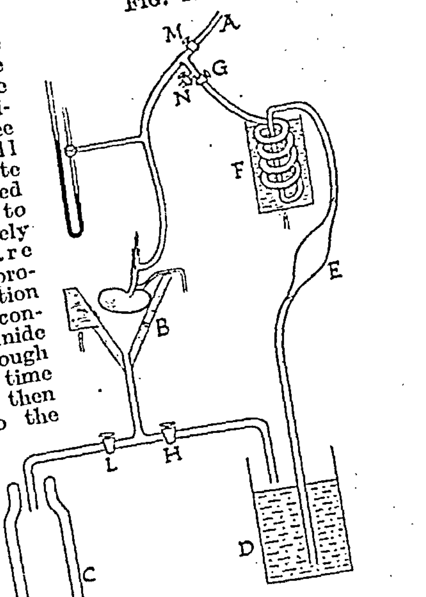
Stimulation, then, of the afferent visceral nerves in the renal area will lead to a reflex active dilatation of the renal vessels and reflex constriction of the vessels of other viscera, occasioning a rise in the general blood pressure.

In the normal animal, however, any rise in general blood pressure is quickly compensated by the bringing into play of the depressor mechanism. A rise in cerebral blood pressure leads, as the cross circulation experiments of Anrep and Starling[1] have clearly shown, to depression of the vasomotor centre and dilatation of the vessels in the splanchnic area. This maintenance of constancy in the arterial blood pressure is one of the most remarkable of physiological facts, any increase in the blood-supply to a particular organ or part of the body being instituted by a redistribution of blood at constant blood pressure. In the normal animal, therefore, the mechanism for causing an increase in the blood flow through the kidney at a constant mean arterial blood pressure is present, and if such reflex dilatation of the renal vessels were exerted to a greater extent on the vasa afferentia of the kidney than on the vasa efferentia an increased glomerular pressure would result. A *sustained* increase in the general arterial pressure could theoretically be initiated in one or more of three ways: firstly, by a general diminution in the capacity of the cardiovascular system produced, for example, by the presence in the blood stream of a substance which caused and maintained an increased degree of contraction of the smaller blood-vessels; secondly, by the continuous stimulation of afferent visceral nerves passing to the vasomotor centre, thus maintaining it in a continued state of increased tone; and, thirdly, by the action of some substance of a chemical nature directly on the vasomotor centre, setting it, so to speak, at a higher tonic register, just as the fever toxins set the thermoregulatory centre to work at a higher body temperature. The mechanism of the production of high blood pressure in man is quite unknown, but in the light of our physiological knowledge of the vital importance of the vasomotor centre in maintaining and controlling the level of the arterial blood pressure in the normal animal, and of our pharmacological knowledge of the manner in which this centre can be influenced by the presence of drugs in the blood stream, it would seem irrational to adopt in explanation of this condition any theory which failed to involve the vasomotor centre as a causative factor in its production. In the high tension found in kidney disease, therefore, our physiological knowledge would predispose us to the view that its original cause was to be found either in a reflex, initiated in the kidney, to the vasomotor centre, or in the circulation of some abnormal substance, or normal substance present in abnormal amount, which had a sustained influence on this centre. In this connexion it would seem advisable to bear in mind the possibility of the vasomotor centre's permanently retaining a functional state originally impressed upon it by nervous or chemical agencies which later cease to function or disappear.

It need scarcely be remarked that mere diminution in the blood flow through the kidney, considered purely as causing mechanically an increase in the peripheral resistance of the vascular system, cannot be entertained as a primary factor in the production of the high tension with which we are concerned.

We must now pass to a brief consideration of the effects of anæmia on the kidney. Temporary asphyxia of the kidney by occlusion of the renal artery was shown by Marshall and Crane[2] to produce on release of the vessel a urine which approached in its percentage composition the blood plasma. Moreover, the urine contained protein, but this quickly disappeared and the composition of the urine soon returned to its state before the artery was occluded. Similar effects can be shown to be produced in the heart-lung-kidney preparation. In the experiment to which I am referring, after obtaining a number of samples of urine from the surviving kidney the artificial respiration was stopped. The heart continued to beat and to maintain a blood pressure of 110 mm. Hg, while the blood in circulation gradually became darker as the heart and kidney used up the oxygen. Towards the end of the asphyxial period and up to the time that the heart failed there was a steady rise of chloride in the urine—i.e., the urine approached in composition the protein-free blood plasma. Still better and more definite results were obtained by the use of cyanide to inhibit or completely eliminate the share taken by oxidative processes in the formation of the urine. Blood containing a trace of cyanide was pumped through the kidney for a time and the kidney then switched back to the heart-lung preparation.

FIG. 1.

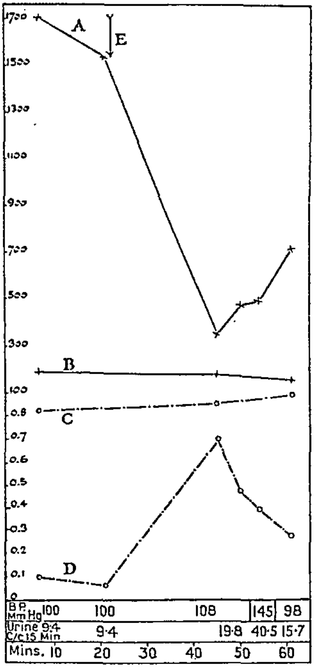


Apparatus employed for the purpose of asphyxiating the kidney suddenly and for a short period of time. For description see text. (E. H. Starling and E. B. Verney. From Proc. Roy. Soc. B., 1925, xcvii.)

The apparatus employed is shown in Fig. 1. The tube A comes from the heart-lung preparation and conducts the blood to the kidney supported in the water-jacketed funnel B. The outflow tube from this funnel passes on the one hand to the Dewar flask C, and on the other to the reservoir D. This reservoir is connected by means of a rubber syringe E and warming coil F to a T-piece in the arterial tube from the heart-lung preparation. Samples of urine are collected and some of the blood of the preparation placed in the reservoir D. To this is added a trace of NaCN, and the syringe, warming coil and tubing are then filled with the mixture as far as the tap G. The blood is being collected from the kidney in the Dewar flask C, the tap H being closed. At a given moment taps M and L are closed, taps G and H opened, and the syringe rhythmically compressed by hand so as to maintain the blood pressure constant at its original level. This is continued for some minutes, when by appropriate turning of the taps already mentioned, the kidney is switched back to its original circulation, and further samples of urine collected for analysis.

The results of one such experiment are plotted in Fig. 2. The temporary approach of the urine in its composition to that of the plasma is graphically represented as well as the speedy recovery which ensues on resuming the natural circulation. In some further experiments performed by Prof. Starling and myself[17] the kidney was perfused by means of a mechanical pump for longer periods of time with cyanided blood, and under these circumstances a pure filtrate of the blood plasma was obtained. The kidney failure was complete, but on reverting to the heart-lung circulation recovery of the organ set in. The kidney cannot be kept for long periods in a state of suspended animation by the use of cyanide. Although during the first ten minutes the filtrate obtained is perfectly free from protein, in the next five or ten minutes a small trace appears, and this amount gradually increases as time goes on. These experiments and those of Marshall and Crane demonstrate how sensitive the kidney is to its contemporary oxygen-supply, and how any interference with this supply speedily leads to failure of the renal units, partial or complete, and to the appearance of protein in the urine. It will be evident that such failure will be accompanied by a retention in the blood of those substances which are normally concentrated during the course of their excretion, and that the degree of this retention in the case of any particular substance will vary directly with the degree to which this substance is normally concentrated by the kidney. In chronic nephritis with polyuria it is the high threshold substances which accumulate in the blood stream.

FIG. 2.



The effects of asphyxia on the composition of the urine secreted by the isolated kidney of the dog. A = urine urea, B = serum urea in mg. per cent., C = serum chloride, D = urine chloride in g. per cent. (as NaCl). At E cyanided blood was pumped through the kidney for 10 mins. (E. H. Starling and E. B. Verney. From Proc. Roy. Soc., B., 1925, xcvii.)

Other experimental facts which have a bearing on the pathology of chronic nephritis will now be briefly mentioned. Firstly, that hypertrophy of the remaining tissue occurs as the result of removing some of the renal substance is well recognised. The hypertrophy, as Sapphir[18] has shown, is accompanied by the enlargement of the existing glomeruli—no new formation of glomeruli and tubules was seen. Secondly, as we saw in the last lecture, when a part of the renal tissue is functionally excluded, the reactiveness of the kidney to the addition of such substances as sodium sulphate and pituitrin to the blood stream is markedly diminished.

In the light of, and as far as possible in terms of the knowledge which has been gained on renal function as the result of physiological and pathological experimentation, it is now proposed to attempt to give a connected picture of the course of the disease of which polyuria forms so striking a symptom. We shall not consider the pathology of the so-called chronic parenchymatous nephritis with its prominent sign of œdema; rather shall we try to trace the course of that type of chronic nephritis which progresses to death without any sign, or one only of the slightest degree, of œdema. We assume the action on the glomerular vasculature of some toxin continuously or discontinuously applied, and leading to a gradual impoverishment in the blood-supply to the renal units. A diminution in the efficiency of the unit as a whole is thus produced. I can find no convincing evidence that in this disease any specific mechanisms within the individual renal unit are functionally impaired to an extent greater than the remaining mechanisms. Fishberg (8b) has come to a similar conclusion. I will illustrate my meaning more fully by referring to the actions of two drugs on the kidney. Caffeine, as Dr. Winton and I[19] have shown on the double heart-lung-kidney preparation, causes an increased flow of urine from the isolated kidney. The composition of this urine is, as far as we have been able to determine, the same as that of the urine produced by the control kidney when the perfusion pressure of this kidney is raised to such a degree that the diuresis so produced is the same as that occasioned by the action of caffeine on the other kidney. Caffeine diuresis, therefore, is a "pressure" diuresis, the individual units in the kidney being simply stimulated to do more work. Phlorhizin, on the other hand, picks out one particular mechanism, the sugar excretory mechanism, in the unit, and the compositions of the urine from each kidney at the same rate of urine flow would in consequence be different (De Boer and Verney).[3] There seems to be no evidence that in chronic nephritis the response of the individual units are affected in any way other than that resulting from a gradual or rapid fall in the efficiency of the whole unit. In the advanced state of the disease the units are in all probability in very different states of efficiency ranging perhaps from normal to zero. In the normal kidney the efficiency of the units composing it may be considered to be high and uniform, in the chronically inflamed kidney low and variable. We may *speculate*, then, somewhat as follows:—

The first effect of the hypothetical toxin on the normal kidney will be to lead to a reduction in the periods of quiescence of some or all of the units of which it is composed. The first reserves of the kidney have been requisitioned. Later the work thrown on the kidney during the day is unable to be completely dealt with, and the composition of the blood is brought back to its physiological optimum by an encroachment on the normal period of nocturnal rest. An increased urine flow during the day and during the night gradually becomes detectable, and is the expression of the increasing failure of the individual units of the kidney. The complete failure of some leads to the appearance of albumin in the urine. Their death with replacement fibrosis leads to a removal of that inhibition on the remainder which the work I described in the last lecture on the isolated kidney led us to postulate. The remaining units are now in a position to receive a greater pressure stimulus and they react to this increased stimulus, as we have seen from the experiments of Rose Bradford and from those on the isolated kidney, by secreting a more copious urine and one which approaches towards the plasma in its composition. Doubtless a work hypertrophy of these units also occurs, but such is insufficient to neutralise the loss of efficiency due to the gradual encroachment of the disease. No difficulty is being experienced, as we have seen in the experiments on the isolated kidney, in the excretion of chloride, but there results an increasing retention of urea and of those substances secreted by a similar mechanism. Eventually the *intrinsically* developed pressure stimulus is itself insufficient to bring about a sufficiently great response by those units which remain in activity. They are working at their maximum under the existing circulatory conditions, and a call is initiated for a further stimulus. This is responded to by an increase in the general blood pressure, and we have already considered the physiological mechanisms by which such a rise can be produced. Whether one of these known mechanisms is involved or not in the production of the high blood pressure of this disease, it is impossible to say in the present state of knowledge. With the death of still further units the work of the remainder can only be increased by a still further rise in blood pressure. The polyuria, then, will be persistent and, coincidently with the falling efficiency of those units which remain to function, its degree must become accentuated if any balance is to be maintained between the production and excretion of bodies such as urea and those eliminated by a similar mechanism. The balance becomes in time too negative to be compatible with life. Such a hypothetical picture of the gradual production and increasing intensity of the polyuria of chronic nephritis is based almost exclusively on physiological mechanisms in so far as they are at present known to exist in manifest or latent form. But the manner in which such mechanisms are correlated and integrated in the struggle to preserve the composition of the body fluids at their optimum is entirely unknown.

In concluding this lecture emphasis may be laid on what may be conceived to be the two essential functional changes responsible for the polyuria of chronic nephritis—viz., an increase in the pressure stimulus to secretion accompanied by a decrease in the efficiency of the kidney as a whole. That is to say, the composition of the urine from a normal kidney supplied with the same blood and secreting at the same rate, would exhibit a far greater recession from that of the plasma than the composition of the urine from a kidney which is the seat of this disease. And that the efficiencies, in this sense, of the individual units of the kidney are also diminished in this condition to varying degrees, would seem extremely probable.

Before I close I should like to thank you, Sir, and the College most warmly for the great honour you have done me in asking me to give these lectures, and although I have not faithfully adhered to the request of the Founder that the lecture should be read "between Michaelmas and Easter, on three days together, both forenoon and afternoon, on some dead body if possibly it can be procured, which shall then and there be dissected for the diseases treated of, and shall afterwards be buried," I hope that the observations which have been brought forward are not entirely irrelevant to the spirit in which this lectureship was founded.

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THE ADMINISTRATION OF INSULIN IN SUSPENSION.

BY O. LEYTON, M.D. CAMB., D.SC., F.R.C.P. LOND.,
PHYSICIAN TO THE LONDON HOSPITAL.

DELIBERATION over the inadequate treatment of one disease occasionally leads to the benefit of patients suffering from another.

Many years ago the tortures suffered by children in whom pericardial adhesion had led to enormous hypertrophy of the heart made me seek some means of preventing the development of this condition. I thought that perhaps a non-absorbable oil such as liquid paraffin, if introduced during the period of effusion, might prevent the adhesion of the visceral and parietal layers of the pericardium. I began by introducing liquid paraffin into the pleural cavities of guinea-pigs and found that this was an efficient method of preventing adhesion when inflammation was produced by injection of aleuron. This has led to the use of liquid paraffin in pleural effusion and has benefited many patients suffering from that complaint, but has not been used to any extent in the much less common disease, pericardial effusion.

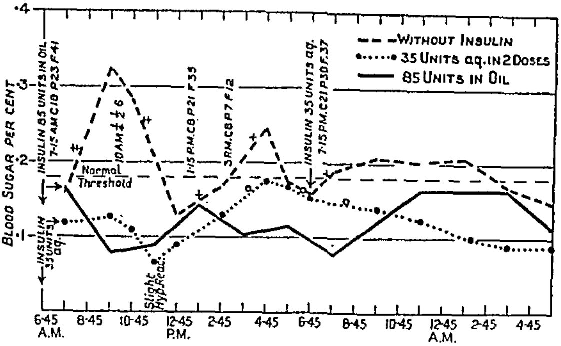
The origin of the work which I am recording in this paper, too, was indirect. In the treatment of diabetes insipidus the injection of five units of some extracts of pituitary gland will control the flow of urine for about four hours. If ten units be given the control may extend to six hours, but a contraction of the bowel is sometimes caused in susceptible subjects. Any further increase in the dose does not appreciably increase the length of time that the diuresis is controlled.

The Problem of Discontinuous Absorption.

Recently I have been supplied with extracts of pituitary gland which contain some quantity of antidiuretic material but very little vasopressin and oxytocin. Their injection does not lead to discomfort, but as they do not contain the substance which causes constriction of the blood-vessels, their absorption is rapid and, consequently, their action is not so prolonged as if they were slowly absorbed. It occurred to me that by making an emulsion I might delay absorption and control the diuresis for 24 hours by a single injection. The antidiuretic substance in pituitary extract might be difficult to prepare as a powder and therefore it seemed wise to transfer the observations to some other substance for a time and return to the treatment of diabetes insipidus at a later date.

I began experiments upon delay in the absorption of insulin and asked a manufacturer to supply me with the drug suspended in oil, thinking that by administering it in suspension its action could be made less intense and more prolonged. At first sight it seemed doubtful whether much would be gained, because it was generally accepted that the best way of giving insulin was to inject, shortly before a meal, the amount needed to katabolise the carbohydrates in that meal. Upon further consideration, however, one is forced to the conclusion that insulin is liberated continuously in the normal body, a larger supply being made available when the sugar in the blood rises above a certain level. The evidence for this conclusion lies in the following facts:—

CHART 2.



1. That neoplasm of the islands of Langerhans leads to death from hypoglycæmia.

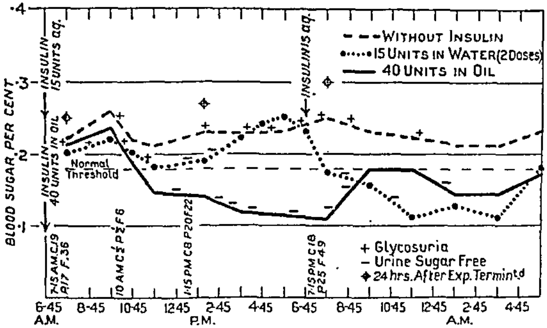
2. *That persistent hypoglycæmia* may occur in individuals who have never received insulin and who, upon exploratory laparotomy do not present any enlargement of the pancreas. These die if they are not fed with carbohydrate at short intervals.

3. *Cases of persistent hypoglycæmia* following the administration of insulin may occur. I have seen the sugar in the blood fall to 0·03 per cent. although insulin had not been given during the previous ten days. One imagines that in these cases the pancreas continues to secrete insulin slowly whilst there is some diminution in the activity of glycolytic ferment.

4. During sleep carbohydrate must be burnt, some from the glycogen stored in the liver and tissues, and some from the protein which is broken down, and for this purpose insulin must be supplied. In the normal individual the concentration of sugar in the blood during the night does not rise sufficiently high to stimulate the production of insulin. If carbohydrate katabolism were to cease during the night, ketosis would develop in some people.

If the pancreas were only to secrete insulin when the sugar in the blood rose above 0·16 per cent., then it would be difficult to imagine how hypoglycæmia could be produced in any other way than by the direct injection of insulin.

CHART 1.



Points in Practice.

Medium of Suspension.—At first it seemed to me probable that an emulsion might be made with the help of lecithin. This indeed proved possible, but the method was soon abandoned because the preparation was not stable.

I then asked for suspensions of pure dry insulin in oil, and Dr. S. W. S. Underhill was so good as to make some experiments in this direction. He found that if insulin were ground up with oils and then centrifugalised, some oils kept the insulin in suspension whilst others allowed it to settle. Probably this depends upon the specific gravity of the oil and also its viscosity and the fine state of division of the insulin.

Arachis oil suspended 60 units per cubic centimetre and possessed many properties which recommended it for use, but unfortunately a certain percentage of patients complained of pain after its injection.

Castor oil was then tried. This oil can suspend more than 100 units per c.cm. of the insulin prepared by British Drug Houses, Ltd. The specific gravity of this oil is about 0·964, against arachis oil 0·918. I found that castor oil did not give pain. No doubt a better medium will be used shortly but for the present it suffices; the suspension appears to be stable and the insulin does not deteriorate rapidly.

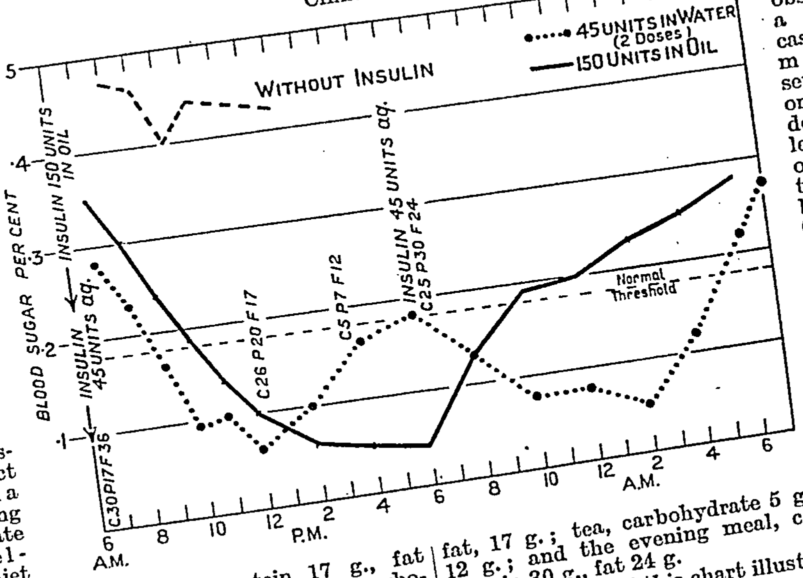
Method of Injection.—Obviously a viscid oil must be injected in a different manner to an aqueous solution. The points which should be observed are: (1) The oil should be warmed before injection, in order to reduce its viscosity (in very cold weather). (2) A thick needle must be used to draw it into the syringe. (3) A needle less fine than that used for aqueous solutions must be chosen for the actual injection; it should be short. (4) A screw-down syringe may be used if the muscles of the thumb of the injector be weak. (5) Lastly, but most important of all, the injection must *not* be intramuscular but subcutaneous. Experience has shown that the least discomfort follows injection under the skin of the abdomen, the injection being given before the patient rises in the morning.

Methods of determining which concentration of insulin in suspension is the most satisfactory.—In my opinion there is a tendency to make all patients conform to the same rules, a procedure which saves work but prevents attainment of the best results. For instance, many advise that the injection of insulin in solution be given 20 minutes before a meal; whereas investigation has taught me that some patients derive more benefit by receiving the insulin 5 minutes, others up to 90 minutes, before the meal. It is unreasonable to expect that all individuals will absorb oleum ricini given subcutaneously at the same rate, or that they will need the same flow of insulin into their tissues. I have therefore made observations with suspensions containing 100, 50, and 25 units per c.cm. When opportunity offers, it is undoubtedly wise to take samples of blood at short intervals and estimate the concentration of sugar in them. If the fall be rapid after the injection, then it would be wise to diminish the concentration of insulin in the oil and vice versa. If there be no opportunity of estimating the sugar in the blood, one of the two following methods may be used:—

1. After an injection of a suspension containing 100 units of insulin per c.cm., urine may be passed every two hours, and it is noted how long it takes for sugar to be excreted in recognisable quantity. This experiment should be continued for two or three days, and then the same dose of insulin should be injected in a larger volume of oil, and once more observations should be made to determine the period during which glycosuria is controlled. By trying different doses and different concentrations, glycosuria may be abolished completely, provided the diet is not greatly excessive and the patient is not completely resistant to insulin.

2. The urine during the 24 hours is collected, mixed, and measured, and the percentage of sugar in it estimated. This is repeated for three days, then the same dose of insulin, but in a different concentration, is given and observations are made as to whether the sugar excreted is increased or diminished. Usually this gives a clue of how it can be abolished completely.

CHART 3.



Illustrative Cases.

Chart 1 illustrates the effect of insulin upon a patient suffering from moderate diabetes mellitus. His diet consisted of: Breakfast, carbohydrate 19 g., protein 17 g., fat 36 g.; lunch at 10 A.M., consisting of carbohydrate 0·5 g., protein 0·5 g., fat 6 g.; dinner at 1.15 P.M., carbohydrate 8 g., protein 20 g., fat 22 g.; supper at 7.15, carbohydrate 18 g., protein 25 g., fat 49 g. This diet was arranged for two doses of aqueous solution of insulin—one was given at 6.45 A.M., and the second at 6.45 P.M. The dotted line shows the rise and fall of the sugar in the blood on that diet and doses of insulin. On the next day 40 units of insulin in oil were administered at 6.45, and the black continuous line shows the rise and fall of the concentration of sugar following that. In all probability the line would have been somewhat flatter if the midday meal had contained more carbohydrate and the evening meal rather less, but the comparison was made with the diet arranged from best results with the two injections. The third line shows the sugar in the blood when insulin has not been given, but apparently the effect of insulin is carried over for more than 24 hours and, on making estimations on the second day of the cessation of insulin, sugar in the blood is found to rise to 0·3 per cent. at 7.30 P.M.

Chart 2.—A patient suffering from somewhat more severe diabetes mellitus. The diet consisted of: Breakfast, carbohydrate 18 g., protein 23 g., fat 41 g.; morning lunch, carbohydrate 0·25 g., protein 0·5 g., fat 6 g.; at 1.15 P.M., carbohydrate 8 g., protein 21 g., fat 35 g.; at 3 P.M., carbohydrate 8 g., protein 7 g., fat 12 g.; at 7.15, carbohydrate 21 g., protein 30 g., fat 37 g.

After the morning dose of 35 units of insulin in solution, the sugar in the blood fell at 11 o'clock sufficiently low to produce symptoms of hypoglycæmia. Towards 5 P.M. the sugar in the blood approached the threshold, started falling, fell and continued to fall after the evening dose at 6.45 of 35 units of insulin. When observations were made upon the action of insulin in oil, the sugar in the blood started considerably higher than on the day chosen for observation with aqueous solution of insulin. The sugar in the blood fell well below 0·1 per cent., but not sufficiently low to give rise to symptoms of hypoglycæmia. Sugar in the blood remained below 0·15 per cent. until 11 P.M., when it rose to 1·7 per cent. I have little doubt that here, too, if some of the carbohydrate given at the evening meal had been transferred to lunch or tea, the sugar in the blood would not have risen so high. The third curve shows the rise and fall of the sugar in the blood when insulin was withheld. The sign O indicates that sugar was not found in the urine whilst the sign + indicates the presence of sugar.

Chart 3 was prepared from observations on a very severe case of diabetes mellitus, so severe that the omission of one dose of insulin led to symptoms of ketosis, whilst the sugar in the blood rose to 0·45 per cent. The patient's diet, however, was quite liberal. Breakfast consisted of carbohydrate 30 g., protein 17 g., fat 36 g.; the midday meal, carbohydrate 26 g., protein 20 g., fat, 17 g.; tea, carbohydrate 5 g., protein 7 g., fat 12 g.; and the evening meal, carbohydrate 25 g., protein 30 g., fat 24 g.

Examination of this chart illustrates very definitely that it is unwise to treat all cases in the same way. The patient was able to absorb insulin in suspension at too rapid a rate when injected in a concentration of 90 units per c.cm.; the effect was too transient, and insulin did not appear to be available for the metabolism of the evening meal. Although the dose of insulin was greater when the single dose was given than when the two aqueous doses were injected, nevertheless 50 g. more sugar were excreted. I concluded that it would be wise to reduce the concentration of the suspension. When the same dose of insulin was given in a suspension of 50 units per c.cm. 30 g. less sugar was excreted than when the two aqueous injections were given—that is to say, 80 g. more carbohydrate was utilised by reducing the concentration of the suspension.

The advantage I claim for the suspension of insulin is, that it will lead to a greater number of recoveries from diabetes mellitus. In my experience cases of recovery have been confined to those who, month after month, have kept the concentration of sugar in their blood continuously below 0·15 per cent. The prolonged action of the suspension will make this much less difficult. In all probability a number of drugs, in addition to insulin and the antidiuretic substance from the pituitary gland, may with advantage be administered in suspension.

It is with the greatest of pleasure that I express my thanks to my first assistant at the London Hospital, Dr. F. B. Byrom, who carried out numberless estimations and sacrificed many hours of sleep in order that the records of cases might be complete. Dr. J. L. F. Steele and Miss R. M. Simmonds, the dietitian to the hospital, rendered invaluable assistance.

PULMONARY NEOPLASMS.

A REPORT OF TWENTY-SIX CASES.

BY T. C. HUNT, B.M. OXF., M.R.C.P. LOND.,
ASSISTANT TO THE MEDICAL UNIT, ST. MARY'S HOSPITAL.

THE growing literature on the subject of intrathoracic tumours has shown from all sides an increased incidence of this condition in recent years. Though this increase is considered by some to be more apparent than real and is attributed, for example, by Fried [17] to better diagnosis, to a larger attendance at hospital, and to "increased human longevity," yet the careful and extensive reports of post-mortem statistics from many German and other authors have proved almost beyond doubt that a true increase has actually taken place. Statistics from the post-mortem records of St. Mary's Hospital are at present being collected and are shortly to be published. When it is realised that pulmonary neoplasm is found in approximately 7 per cent. of all autopsies on patients dead from carcinoma (various figures being 9·7 per cent. Wahl,[35] 10·7 per cent. Ferenczy and Matolcsy,[14] 5 per cent. Lubarsch,[25] 8·9 per cent. Biberfeld [6]) and ranks next in frequency only to carcinoma of the stomach, breast, uterus, and œsophagus (Lighty, Wright, and Baumgartner,[24] Gruber [19]) its importance can hardly be over-estimated. Since, furthermore, the percentage of early correct diagnoses is not generally greater than 33 per cent. (Sehrt [30] 4 per cent., Ferenczy [14] 25 per cent.), a further report of even a few cases only may be of some value.

The 26 cases here described have all been in the wards of St. Mary's Hospital at some period during the last six years (1922–28), and all have been examined post mortem. Twenty of them were in the Medical Unit wards (under Prof. F. Langmead); for permission to examine the notes of the remaining six patients I am indebted to Sir John Broadbent, under whose care they were.

The post-mortem findings confirm the now well-recognised fact that the overwhelming majority of intrathoracic neoplasms—often wrongly called "mediastinal tumours"—are in fact not mediastinal in origin—i.e., sarcomatous—but are of true carcinomatous nature. Of these 26 cases, for the histological examination of which my thanks are due to Dr. W. Newcomb, 21 are of the "oat-celled" type, three are composed of mixed polygonal and columnar cells, and two of squamous cells. They are thus, according to the views of the majority of workers on this subject, all carcinomata, the very common "oat-celled" type being considered either as a true bronchial mucosa tumour (Barnard,[4] Aschoff [2]), or as a growth of the alveolar lung epithelium itself.

Primary lung sarcoma and true mediastinal lymphosarcoma are undoubtedly rare. Staehelin [34] finds intrathoracic neoplasms to be almost all bronchial carcinomata. Barnard,[4] Fishberg,[16] Ferenczy,[14] Brandt,[7] Duguid,[10] Shennan,[32] and many others agree, and Sonnenfeld [33] saw only one case of sarcoma and affirmed that at least 95 per cent. of primary thoracic new growths are in fact bronchial carcinomata. Among 30 cases examined by Dr. Newcomb at St. Mary's Hospital only one was a fibrosarcoma of lung, one a true lymphosarcoma of the mediastinum, and one a teratoblastoma; the remaining 27 were carcinomata, 21 being of the "typical oat-celled" type, four of mainly polygonal-cell structure, and two of squamous epithelium.

Sex, Age, and Localisation.

Of the 26 patients here described 20 were men and only 6 were women. This shows a male preponderance of more than 3 to 1, which is even greater than has been found in many other series. Ferenczy [14] quotes 16 writers who all found a marked preponderance of male over female. Ewing [13] gives 71·9 per cent. as the percentage of men affected in 100 cases; Kikuth [23] and Dynkin [11] and Sachs [27] place the rates at 1·9 to 1 and 1·8 to 1. Ferenczy's own cases showed almost a 3 to 1 relationship; Rubenstone [26] found 8 men in 11 cases and Shennan [32] 27 in 31.

The average age was 50 years, the youngest being 27 and the oldest 79; this agrees with statistics of German writers who find the maximal incidence of these tumours between the ages of 50 and 60.

Sixteen—or 61 per cent.—originated, as far as could be determined, on the right side, and of these growths nine appeared primarily to have affected the upper lobe and seven involved either the whole lung or were mainly basal. An excessive incidence of right over left lung has been frequently noticed, Seyfarth [31] finding a ratio of 2 to 1. Holzers,[20] Briese's,[8] and Wolf's [36] figures agree, but Kikuth [23] and Marchesan found no appreciable difference. Many suggestions have been made to account for this increased liability of males to pulmonary carcinoma, particularly in the right lung, and any theory of ætiology must in some measure explain these facts. Some have thought that the more frequent respiratory "insults" that man, as compared to woman, must meet in his work, may account for this difference; road dust, tobacco, tar particles, cobalt, and arsenic in the air are some of the possible causal factors put forward. Duguid found that outdoor workers in Manchester seemed more liable to these tumours than those who worked in more sheltered conditions; Hudson [21] found a high incidence in grooms and stablemen. Shennan,[32] however, found nothing suggestive in the previous occupations of his patients, nor could Sehrt [30] connect these growths with any particular profession. Seyfarth's [31] patients were mainly labourers and land-workers, and 75 per cent. of Ferenczy's patients were also labourers, 48 per cent. of whom had had work in which the respiratory organs tended especially to be affected. Frommel [18] in France also noted that 29 of his 41 patients had been especially liable in their professions to inhalation of road dust. It seems that in recent years some new agent has appeared or increased in the air, which in some way makes the bronchial mucosa more liable to new growth formation.

The suggestion of Schwyter [29] (who found congenital malformation of the lung tissue in the neighbourhood of the growth in five cases out of eight) that developmental errors may be a cause of pulmonary carcinoma, remains unconfirmed. There is, however, some evidence to show that simple chronic irritation, as, for example, by chronic bronchitis, is an especial predisposing cause; influenza has been particularly blamed in this respect (Feyrter [15]) and tuberculosis has by others been considered as "the chief ætiological factor" (Ewing [13]) and "the forerunner" (Frommel [18]). The incidence of such conditions, however, does not appear to be higher as a whole in patients dying of pulmonary cancer than in those dying of other non-respiratory disease, and both chronic bronchitis and old or active tuberculosis are clearly not uncommon coincident findings in a large proportion of all post mortems. In these 26 cases a very definite history of somewhat severe previous respiratory affections was found in 13—i.e., 50 per cent., made up of influenza (6, including one patient who had also had pneumonia), chronic bronchitis (4), tuberculosis (2), pneumonia (2). Two of these had also suffered from asthmatic attacks. This is a somewhat high incidence and may possibly have some ætiological significance, though not to the same extent as was apparently the case in Berblinger's [5] series, or those of Feyrter or Frommel. In 12 of these patients it is possible to presume some particular liability to respiratory irritation, as they had been respectively: painters (4), engineers (2), dustmen (1), motor drivers (2), carpenter (1), brass-finisher (1), and coal-labourer (1). There was no case among stablemen as found by Hudson[21] and O'Donnell, nor a special preponderance among outdoor workers. Four patients only gave a history of excessive tobacco-smoking, and in no case was there any suggestive feature in the family history.

TABLE SHOWING THE CHIEF CLINICAL FEATURES AND PATHOLOGICAL FINDINGS IN 26 CASES OF PRIMARY NEW GROWTH OF LUNG.

Case.	Sex.	Age.	Occupation.	Previous history of respiratory disease.	Onset (first symptoms).	Hæmoptysis.	Effusion.	Length of life from onset of symptoms in months.	Type of carcinoma.	Situation of growth (probable origin).
1	M.	55	Taxi-driver	Nil	Pain→ dyspnœa	None	Purulent	4	Oat-celled	R. lower lobe
2	M.	65	Pensioner	Nil	Dyspnœa→ cough	Early	None	12½		R.(? upper) lobe
3	F.	40	Housework	Nil	Pain→ dyspnœa	Present	Hæmor.	17		L. lung (entire)
4	M.	32	Grocer	Nil	Aphonia→ dyspnœa	None	None	8		L. lung (hilum)
5	M.	51	Salesman	Cough (10 years)	Pain→cough	Early and continued	„	12	Polyg. and col.-celled	L. lung (upper)
6	F.	59	Saleswoman	" Always chest trouble."	Pain→cough	None	„	—	Oat-celled	R. lung (root)
7	M.	40	Postman	Nil	As "bronchitis"	Severe	Hæmor.	6		R. lung (root)
8	M.	46	Painter	Influenza (frequent)	Aphonia→ cough	None	Bilateral	3		R. and L. root
9	M.	46	Clerical (G.P.O.)	Nil	Bronchitis→ "swelling of neck"	Late	Present	6		R.(? upper) lobe
10	M.	43	Engineer	Influenza, phthisis, bronchitis	Stridor→ dysphagia	Present	None	5	Polyg. and col.-celled	R. lung (? upper lobe origin)
11	M.	57	Brass-finisher	Bronchitis (6 years)	Dyspepsia→ dysphagia	„	„	3	Oat-celled	R. lung (lower)
12	F.	54	Housework	Influenza	Dyspnœa	None	Hæmor.	15		R. lung
13	M.	63	Electrical engineer	Phthisis	Œdema of arm →cough	Early	None	4		R. upper lobe
14	M.	48	Motor-driver	Nil	Cough	„	Present	6		L. lung
15	M.	58	Painter	Nil	Pain→cough	None	„	1½	Polyg.-celled	L. lung
16	M.	79	—	Nil	Dyspnœa→ dysphagia	„	Hæmor.	4	Oat-celled	L. lung
17	M.	49	Carpenter	Influenza	Pain→dyspnœa	Present	None	12		L. lung
18	F.	60	—	Asthma, cough (3 years)	Pain→dyspnœa	None	Present	8		R. lung (root)
19	M.	60	Painter	Influenza, bronchitis	"Bronchitis"→ pain	„	Hæmor.	4		R. lung (upper)
20	M.	35	Dustman	Pneumonia, influenza	Cough→ "swelling of neck"	„	None	3½		R. lower lobe
21	F.	45	Housework	Nil	No symptoms	„	„	—		L. lung
22	F.	39	Housework	Nil	Œdema of face →dyspnœa	„	Pseudo-chylous	4		R. lower lobe
23	M.	27	Coal-labourer	Nil	Pain→ "bronchitis"	Early and continued	Present	6		R. lower lobe
24	M.	60	Publican	"Chronic" cough	Cough→ hemiplegia	None	None	7	Squamous-celled	L. lung
25	M.	47	Painter	Pneumonia	Vomiting→ "bronchitis"	Present	„	4	Oat-celled	R. upper lobe
26	M.	44	Railway guard	Nil	Pain→coma	None	„	6	Squamous-celled	R. lower lobe

Hæmor., hæmorrhagic. Polyg., polygonal; col., columnar.

Special Features.—CASE 5: Old tuberculosis both lungs (extensive). 6: Death from pulmonary embolism. 8: Origin probably on right side. 10 and 11: Death from profuse hæmoptysis. 12: Collapse and death after aspiration of chest. 14: Bronchiectasis, gangrene, empyema, septicæmia. 16: Pericarditis and heart failure. 21: Accidentally found at autopsy; death from other causes. 23: Pericarditis and heart failure. 24: Secondary deposit in right cerebral cortex. 25: Diagnosed "aneurysm." 26: Secondary deposit in left cerebral cortex.

Course, Symptoms, and Signs.

The course of bronchial carcinoma has been described as slow and gradual, and this may well be true, since it is rare for patients to come under observation until the growth is well advanced. At first the condition causes few symptoms and there is no tendency to cachexia, loss of weight, or anæmia; in our patients the strikingly good general condition was noticeable until the late and final stages of the disease, and in several instances heavy work was continued until within a few weeks of death. When once it has made itself felt, however, bronchial carcinoma takes a rapid course, and the average length of life in these patients from the first definite symptom was almost exactly six and a half months. The shortest duration was one and a half, the longest 17 months. Sonnenfeld[33] found a course—dating from the first symptom—of from three months to three years, but no definite data exist as to the actual total duration from the commencement of the growth itself. Fried[17] emphasises the slow growth of these tumours and considers this to be one reason why metastases are so common, but though there is doubtless a relatively long symptomless latent course, it is difficult to believe that the average total duration can be more than two years.

Early diagnosis of pulmonary carcinoma is obviously not of the same hopeful importance as it is, for example, in the case of gastric or mammary cancer, though Sauerbruck[28] Edwards,[12] and Lilianthal have discussed the advantage of thoracotomy and if possible lobectomy early in the disease. From a prognostic point of view, however, it is a vital consideration. A few features only will be here considered. The early symptoms of the condition frequently resemble pulmonary tuberculosis, and it is often diagnosed as such, particularly by X ray evidence (Uspensky[37]). The onset, however, appears often to be with pain, which is not very common in tuberculosis. Among these 25 patients (one, in whom a small symptomless growth was found accidentally at autopsy, is omitted) nine, or 36 per cent., complained at first of pain only; in five cases this preceded any other disturbance by many weeks and was of a dull, aching character, spreading to the shoulder-blade of the affected side and in two cases down the arm. This is unlike tuberculosis and is very easily mistaken for fibrositis or "neuralgia." It is probably due to pleurisy over the growth, and in a few cases to nerve-pressure with referred pain via the phrenic nerve to the shoulder. Five of these eight patients—or 62 per cent.—either at once or later developed a pleural effusion, so that pleural pain may well account for the majority. In only four cases was a rub heard. Many other cases began as "influenza" or "bronchitis," and a strikingly frequent mode of onset was an acute attack of illness with cough which was invariably diagnosed as "influenza" or "bronchitis"; this kept the patient to his bed for a short time 7 to 21 days—and was followed by a return to work for a few weeks, then a "recrudescence" of the original "influenza," and thenceforth a steady and rapidly progressive course until death. Six of these cases showed exactly this history, and the original acute attack again appears to be due to the first affection of the pleura as the growth spreads outwards, though in no case was it quite typical of an ordinary simple pleurisy. Three patients complained of dyspnœa from pressure on a bronchus as their first symptom (two with cough), and seven suffered from the effects of pressure or other structures—i.e., two from hoarseness and loss of voice (recurrent laryngeal nerve), two from dysphagia (œsophagus), one from stridor (trachea), and two from œdema of the arm or face (large veins). No clear prognostic import could, however, be deduced from the mode of onset in these patients, though those whose illness began with "bronchitis" lived on an average three months longer than those in whom it started with primary pressure symptoms. In no case was hæmoptysis the earliest symptom, as is considered to be frequent by Sonnenfeld (50 per cent.), and indeed the so-called typical red-currant jelly sputum appeared to be actually rare in this condition (see also Abraham [1]). Of these patients, 12—or 48 per cent.—showed during the disease either blood-streaked sputum or a severe hæmoptysis; in five it was an early event, in two it was the immediate cause of death. Cough and dyspnœa were both absent in one patient only, who complained of some pain and dysphagia, was treated by gastrostomy, and died suddenly from a profuse hæmoptysis. The rapid progress of the dyspnœa in the later stages of the disease was very typical, and indeed at this time the diagnosis could often be made at sight. The swollen, congested face and arms, the constant restlessness, and anxious, worried expression formed a characteristic picture.

The physical signs were most variable. In 12 of these patients they were those of effusion; in six the effusion was present on first examination, and in five it developed later in the disease. One patient was operated upon for empyema, and in five cases the fluid was hæmorrhagic. The presence or absence of an effusion did not appear, however, to exert any influence on the duration of the disease, but since it was present in 48 per cent. of these patients an otherwise unexplained effusion in an elderly patient must always arouse suspicions of a growth of the lung. Staehelin [34] found that one-third of his patients already had a pleural effusion when they first came to a doctor. The position of the heart's apex-beat is in such cases often misleading, and indeed in all cases of pulmonary carcinoma appears to be an unreliable guide. In these 25 patients the apex-beat in five was displaced towards the side of the growth, in ten it was displaced towards the healthy side, and in ten no appreciable change was found. Abraham [1] also noted that the displacement of viscera towards the affected side did not exclude growth, and in two patients in this series in which an actual effusion was present such retraction was noticed. Marked flattening of the chest was noticed in three patients only, but impaired movement on respiration was found in sixteen and dullness on percussion in all, either early or late. Bulging of the chest wall occurred in four and an external growth was seen in three. The auscultatory signs varied with the stage of the growth and with the presence or absence of associated infection or effusion. Five patients had the typical signs of a cavity, but the commonest findings were weak or absent breath-sounds with a few coarse râles and slightly diminished vocal resonance. Clearly there can be no constant group of signs typical of pulmonary new growth. Enlargement of veins of the neck or over the thorax, for example, was only noted as an early sign in five patients (or 20 per cent.) and palpable enlarged glands in the neck or axilla occurred only in eight (or 31 per cent.) during the whole course of the disease.

Diagnosis.

Early diagnosis must depend largely upon X rays. The sputum was in no case sufficiently characteristic, and in only three patients did examination of the pleural fluid give definite assistance by showing the large endothelial cells said to be typical of these growths. The physical signs alone were seldom sufficient in themselves to establish an early diagnosis. Fishberg [16] considers that the examination is incomplete unless, besides X rays and lipiodal injection, bronchoscopy with removal of a portion of tissue has also been carried out. When fluid is present X rays alone are especially untrustworthy and can seldom give definite indication of the cause of the effusion. According to Kirklin [22] the three radiological characteristics of early malignant disease are density of the hilum, atelectasis, and bronchiectasis.

The most frequent sources of difficulty in diagnosis in this series were tuberculosis and mediastinal tumour; growths that start close to the hilum, beginning with early pressure signs, especially resemble growths of the mediastinum. Two cases were mistakenly diagnosed as carcinoma of the œsophagus, one as subphrenic abscess, and one as empyema. In two patients a primary pulmonary growth was unsuspected, since the clinical picture was entirely dominated by the neurological condition caused by the presence of secondary deposits in the brain. One presented a complete hemiplegia (growth in the right cerebral cortex), the other had epileptiform convulsions and coma without definite localising signs (growth in left cortex). One patient was thought to have an aortic aneurysm, and in one the growth—a very small "oat-celled" carcinoma—was discovered by chance at autopsy. The frequency with which these patients present themselves as "neurological cases," with symptoms due to metastases in the central nervous system, has been emphasised by Fried, who ascribes it to a hæmatogenous spread dependent upon the anatomical relations of the vessels of the lungs and brain. Of his 10 patients, 9 complained of nervous symptoms. Lubarsch [25] also described five cases in which the condition first showed itself through cerebral metastases, and Seyfarth [31] mentions as many as 32.

In 18 the correct diagnosis of intrathoracic neoplasm was made before death, but since the rarity of true mediastinal lymphosarcoma has been realised our difficulty lies less in determining the nature of the growth than in locating more precisely its site and point of origin. Unfortunately in this series no light can be thrown upon the prognostic difference between growths originating presumably in the bronchi themselves and those arising in the pulmonary alveoli.

Treatment.

The only treatment possible has been palliative; nearly all the patients were more comfortable propped up well forward in bed, and some ingenuity was often necessary to maintain them in a comfortable position. Deep X ray therapy in most cases produced temporary improvement and lessening of symptoms, but did not seem appreciably to check the course of the disease; severe transitory "reactions" occurred in two cases and very striking "remissions" in three. A more detailed list of these cases is shown in the table and a short bibliography of some papers on this subject is appended.

Summary.

1. Twenty-six cases of pulmonary carcinoma are described, 21 being histologically of the "oat-celled" type. 2. No distinction could be made clinically between the "oat-celled" type and lung tumours of polygonal, columnar, or squamous-celled type. 3. The ratio of men to women affected was, approximately, 3 to 1. 4. A somewhat marked incidence of previous lung affections, especially influenza and bronchitis, was found. 5. No connexion between the incidence of the growths and previous occupations could be traced. 6. Especially common modes of onset were (1) with pain in the chest alone; (2) with *an acute febrile attack of "influenza" followed by a* temporary return to work. 7. Early pressure signs were frequent, and should not necessarily suggest mediastinal tumour rather than a pulmonary growth. 8. The average age of the patients was 50, and the duration of the disease (from first symptom to death) was six months. 9. Hæmoptysis occurred in 48 per cent. and pleural effusion in 48 per cent. of these patients. 10. The position of the heart's apex was variable and was unaltered in 40 per cent. 11. Metastases were not a frequent cause of symptoms.

I should like to express my gratitude to Prof. F. S. Langmead, at whose suggestion this paper was prepared, for permission to examine the patients under his care and for his assistance in the consideration of the cases.

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BERKSHIRE CONTRIBUTORY SCHEME.—Last year £27,452 was collected by the Berkshire and Associated Hospitals Aid Committee, an increase over the preceding year of £3299, which constitutes a "record." The formation of five new branches partly accounts for this rapid growth. The expenditure on administration was £1407.

A POOR-LAW COUNTRY HOME.—The Birkenhead guardians have bought for £10,000 Sir Henry Vernon's residence, Eastham House, in the Wirral District, and have opened it as a home for aged and infirm poor and for convalescent patients from Tranmere Infirmary. The house which stands in 50 acres, has an oak-panelled staircase carved with scenes from *The Canterbury Pilgrims.*

OBSERVATIONS ON THE TREATMENT OF TWO CASES OF POLYCYTHÆMIA VERA WITH PHENYLHYDRAZINE HYDROCHLORIDE.

BY W. MACKAY, M.B. GLASG.,
PHYSICIAN TO OUT-PATIENT DEPARTMENT, GLASGOW ROYAL INFIRMARY; JUNIOR ASSISTANT TO MUIRHEAD PROFESSOR OF MEDICINE, GLASGOW UNIVERSITY.

FOR some time past it has been recognised that phenylhydrazine hydrochloride has the power of destroying red blood corpuscles, and it has been used by many investigators to produce anæmia in animals. Within recent years it has been exhibited for the same purpose in the treatment of polycythæmia vera. Eppinger and Kloss, while stating that there was an increased formation of red corpuscles in the bone-marrow in this disease, produced evidence to show that the process of red cell destruction was not so active as would be expected; therefore in 1918 they prescribed phenylhydrazine with the idea of stimulating the destruction of erythrocytes. They first administered the drug subcutaneously in solutions varying in strength from 1 per cent. to 10 per cent., but later they obtained the same results on giving the drug by the mouth. They considered this method of treatment to be an almost harmless means of reducing the number of red blood corpuscles and hæmoglobin. Since then it has been used by Taschenberg, Owen, Brown and Giffen, and others with very similar results. In all cases the red cells and hæmoglobin were diminished, while in some a moderate leucocytosis was produced. Jaundice appeared in the course of treatment, the urine became very dark in colour, and in a number of cases urobilin was present. It was noted by Owen, and Brown and Giffen that the red corpuscles continued to diminish in number for a varying period after the drug was stopped. In most of the cases reported the signs and symptoms of the disease returned in from two to six months, and the treatment had to be repeated. Taschenberg observed in his case that the desired effect did not always take place after repeated courses of treatment, and he thought that the drug might in some way harm the liver. Wells described lesions appearing in the liver when animals were poisoned with sulphate of hydrazine. Bodansky, working with phenylhydrazine, showed that it had a destructive action on the liver, and that variations in the lævulose-tolerance curve could be taken as an index of the toxic action of phenylhydrazine on the liver cells.

Recently we had the opportunity of treating two cases of polycythæmia vera with phenylhydrazine hydrochloride, and we resolved to record the histological changes in the blood. In the course of treatment certain other observations were made on changes taking place in the blood plasma, and in the resistance of the red cells to hypotonic saline.

CASE 1.—A male, aged 42, an engineer, first came under observation in 1922 complaining of giddiness, headache, and weakness in the legs which prevented him from working. The ears, lips, and tongue were cyanosed and the breath had a peculiar odour. The systolic blood pressure was 152 mm. of mercury, but the heart was not enlarged. The spleen could not be palpated, although the splenic area was enlarged to percussion. There was nothing of note in the past health or family history. The Wassermann reaction was negative. Three and a half months later the spleen was palpable at the costal margin. In August, 1925, the face, ears, lips, nose, and fingers had a deep crimson colour, and by December of that year the spleen could be palpated 1½ inches below the costal margin.

On admission in 1922 the red cells numbered 9½ millions, and from that date until readmission to hospital in April, 1927, the red cells varied between 7 and 9 millions. During these five years he had been taking benzol by mouth more or less continuously.

On April 26th, 1927, he was readmitted. He had been unfit for work, and on examination the cardiac area was found to be slightly larger than normal and the radial arteries palpable. The spleen reached forwards and downwards to the level of the umbilicus 1 inch from the middle line, and the red cells numbered 9 millions. He was given grs. 3 of phenylhydrazine hydrochloride twice daily and, on three occasions at weekly intervals, 7 oz. of blood were withdrawn from one of the veins of the arm. In four weeks the red corpuscles were reduced to 5 millions and he was dismissed from hospital feeling very well. He reported frequently and phenylhydrazine hydrochloride was prescribed from time to time, as the blood count indicated, in doses varying from gr. ½ to grs. 2 twice daily. By May, 1928, the red cells numbered 6½ millions and, as he was not feeling fit, he was again readmitted for observation on May 25th. He was treated with a fresh supply of phenylhydrazine hydrochloride, for it was thought that the old stock had deteriorated and was not having the desired effect. This ultimately proved to be the case. The following table shows the dosage given and the response obtained after admission to hospital on May 25th, 1928.

TABLE I.—*Selected Blood Counts in Case 1.*

Days after admission.	Red blood cells, millions	White blood cells.	Hæmoglobin, per cent.	Colour-index.	Blood-platelets.	Reticulocytes, per cent.
3	6·6	17,000	100·0	0·76	332,000	Nil.
6 (*a*)	6·4	16,600	107·0	0·82	—	„
8	6·9	19,600	120·0	0·87	601,000	„
9 (*b*)	—	—	—	—	—	—
11	5·7	22,400	98·5	0·86	573,000	Nil.
13 (*c*)	5·4	28,400	87·0	0·79	334,890	8·0
15	5·0	20,700	80·0	0·8	503,000	3·8
17	4·4	26,600	65·0	0·74	—	—
18 (*d*)	4·4	41,000	62·5	0·71	769,700	4·0
19	4·1	29,800	60·0	0·75	—	3·9
21	3·5	22,600	62·5	0·8	518,520	5·0
22 (*e*)	—	—	—	—	—	—
23	3·2	22,400	56·0	0·87	—	4·0
25	3·7	20,200	55·0	0·74	—	8·0
28	3·3	17,400	52·0	0·78	—	1·0
32	4·2	20,200	60·0	0·71	—	4·0
39	4·0	19,100	68·0	0·86	—	3·0
46	4·8	25,000	76·0	0·8	—	—
60	5·2	16,800	112·0	1·07	—	—
90 (*f*)	9·1	13,000	110·0	0·6	—	—
98	6·1	20,000	110·0	0·9	—	—
102	6·7	24,600	125·0	0·9	—	—
109	6·6	21,000	106·0	0·8	—	—
116 (*g*)	4·4	21,800	77·5	0·88	—	—
130	4·6	22,600	90·0	1·0	—	—
152	5·8	10,400	115·0	0·99	—	—

(*a*) Phenylhydrazine hydrochloride grs. 1½ given t.i.d.
(*b*) „ „ grs. 3 „ b.i.d.
(*c*) „ „ grs. 1½ „ t.i.d.
(*d*) „ „ stopped.
(*e*) Dismissed from hospital.
(*f*) 15 oz. blood removed by venesection. Phenylhydrazine hydrochloride grs. 3 given daily.
(*g*) Phenylhydrazine hydrochloride stopped.

CASE 2.—A male, aged 74, an artist by profession, was admitted to hospital after a hæmatemesis which had occurred 14 days previously. On other occasions he had vomited blood, and one year earlier he had had a hæmaturia, cystoscopic examination at this time failing to reveal any cause for the bleeding beyond some congestion of the prostatic venous plexus. Six months later he had developed phlebitis in both legs. For the past 15 or 20 years he had been subject to attacks of indigestion. The face and lips were well coloured, but there was no cyanosis. The area of cardiac dullness was within normal limits, but the spleen extended downwards to about three inches below the costal margin. The Wassermann reaction was negative. The dosage of phenylhydrazine hydrochloride given and some of the changes observed in the blood are shown in Table II.

The phenylhydrazine hydrochloride was given in gelatin capsules and administered by mouth, the amount varying from grs. 4½ to grs. 6 daily. Usually the dose prescribed was grs. 1½ thrice daily to begin with, then it was increased to grs. 3 twice daily until the red corpuscles began to fall in number, when the dose was reduced to grs. 1½ thrice daily. This was continued until the red cells numbered about 4½ millions, when the drug was discontinued. In Case 1 the total amount of phenylhydrazine hydrochloride prescribed over a period of 12 days was grs. 63, and in Case 2, in 20 days, grs. 103½ were administered. The red cells began to decrease in number in the first case after grs. 10½ had been given, while the second case required grs. 70½ before any response was evident. It therefore appears that some individuals respond more quickly than others to the treatment, but it should be noted that Case 1 was aged 48, and Case 2 aged 74. The exhibition of the drug was controlled by frequent blood counts and, in view of its toxic action on the liver cells, as shown by Wells and Bodansky, lævulose-tolerance curves were made before, during, and after treatment. The curves obtained were never indicative of hepatic inefficiency.

TABLE II.—*Selected Blood Counts in Case 2.*

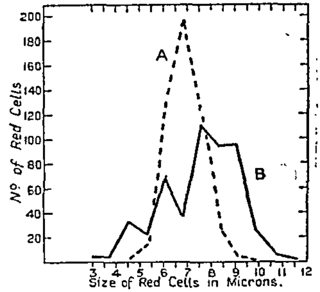
Days after admission.	Red blood cells, millions	White blood cells.	Hæmoglobin, per cent.	Colour-index.	Blood-platelets.	Reticulocytes, per cent.
4	7·6	9,800	87·5	0·57	421,740	—
5 (*a*)	—	—	—	—	—	—
7	8·0	10,600	91·0	0·54	478,800	0·5
9	7·1	11,800	92·5	0·65	—	0·1
11 (*b*)	8·3	9,900	106·0	0·64	—	1·0
13	7·7	9,000	95·0	0·63	689,400	1·0
15	7·3	10,600	81·0	0·55	—	1·0
17	7·7	11,600	92·0	0·6	—	—
20	6·2	14,000	75·0	0·6	820,610	3·5
21 (*c*)	—	—	—	—	—	—
22	5·4	13,600	72·0	0·67	—	5·0
24 (*d*)	4·3	10,400	55·0	0·64	988,200	4·4
26	3·0	16,200	62·5	1·01	—	—
29	2·7	16,400	45·0	0·86	—	8·0
31	2·7	13,000	50·0	0·92	—	15·0
35	2·8	7,000	68·0	1·02	—	6·0
42	3·6	6,800	77·5	1·07	217,200	
49	4·1	6,000	100·0	1·2	—	—
55 (*e*)	—	—	—	—	—	—
124	5·7	—	110·0	0·9	—	—

(*a*) Phenylhydrazine hydrochloride grs. 1½ given t.i.d.
(*b*) „ „ grs. 3 „ b.i.d.
(*c*) „ „ grs. 1½ „ t.i.d.
(*d*) „ „ stopped.
(*e*) Dismissed from hospital.

Remarks.—Fourth and thirteenth days after admission: bilirubin less than 0·25 units. Twentieth day: bilirubin 0·5 units. Twenty-fourth day: bilirubin 1 unit.

Effects on the Blood.

From the tables of blood counts it will be seen that the red cells became reduced in number, and that the diminution continued for some time after the drug was stopped, for a period of ten days in the case of the first patient and five days in the second patient. The latter at first responded very slowly to the action of the phenylhydrazine, but when the red cells did begin to decrease they did so very rapidly, falling from 7·7 millions to 2·7 millions in 12 days. At first the fall in the percentage hæmoglobin was more or less parallel with the fall in the number of red cells, but as the anæmia became more profound, and later when the red corpuscles were beginning to increase in number, there was an increase in the colour-index. This was most noticeable in Case 2. On the twenty-ninth day after admission there was an increase in the mean



Price-Jones curves showing the greater variation in size and an increased proportion of large red cells in the circulation three days after treatment had been discontinued. A is the curve obtained the second day after admission—i.e., before treatment. Mean diameter of red cells 6·95 μ. B is the curve on the twenty-ninth day after admission. Mean diameter of red cells 7·72 μ.

diameter of the red cells as compared with the mean diameter before treatment was commenced.

Examination of blood films from day to day showed the gradual appearance of nucleated red cells (normoblastic in type), reticulocytes, polychromasia, poikilocytosis, and anisocytosis, all of which became more marked as the anæmia became more profound. An increasing proportion of the red cells were megalocytes, and as time went on the blood gradually assumed a megalocytic character. This is shown graphically in the figure, in which two curves, plotted after the fashion of Price-Jones, show the differences in size (mean diameter), and the alteration in the proportion of cells of various sizes, between 500 red cells on the second day of admission—i.e., immediately before treatment was commenced, and another 500 red cells on the twenty-ninth day—i.e., three days after the phenylhydrazine had been discontinued.

There was a tendency for the blood platelets to increase in number during treatment, and the reticulocytes increased as the anæmia became more marked. While the phenylhydrazine hydrochloride was being given there was a progressive leucocytosis in each case, but as soon as the drug was discontinued the white cells immediately began to return to the level, or even below the level, at which they had been before treatment started. The leucocytosis was entirely due to cells of the granular series, particularly the neutrophil polymorphonuclear leucocyte. There was, however, a slight percentage increase in the number of basophil and eosinophil polymorphonuclear cells. In each case there was an absolute and relative diminution in the number of lymphocytes.

In the course of treatment jaundice appeared, first in the scleræ and a few days later becoming generalised over the body, but it was always slight. The van den Bergh reaction was never of the direct type, and the indirect reaction showed a gradual increase in the bilirubin content of the blood serum as the jaundice became more widespread. (Tables II. and III.) After treatment was discontinued, the icterus cleared up within a few days in each case. Table III. also shows the changes in the blood nitrogen and the blood cholesterol in Case 1. There was a slight increase in the former while the plasma cholesterol fell from 160 mg. per 100 c.cm. to 70 mg. per 100 c.cm. during the administration of the drug.

TABLE III. (*Case 1.*)

Days after admission.	Red blood cells, millions	Bilirubin, units.	Blood.			Urinary urea, per cent.	Urobilin.
			Cholesterol (plasma), mg. per 100 c.cm.	Nitrogen.			
				Urea.	N.P.N.		
				mg. per 100 c.cm.			
3	6·6	(under 0·25)	—	—	—	—	—
4	—	—	160	11·0	33·0	—	—
5	—	—	—	—	—	1·8	—
6 (*a*)	6·4	—	—	—	—	—	—
7	6·9	0·25	—	—	—	1·7	—
11	5·7	(more than 0·25)	100	—	—	2·3	—
13	5·4	—	—	23·2	45·0	2·2	—
14	4·9	1·2	126	—	—	2·7	—
16	4·7	2·0	—	—	—	2·7	—
18 (*b*)	4·4	3·0	70	24·2	45·0	2·6	+
21	3·4	1·5	80	22·0	50·0	2·4	—
60	5·2	0·25	118	—	—	—	—

(*a*) Treatment commenced. (*b*) Treatment stopped.

Observations on the fragility of the red cells did not reveal anything unusual in Case 2, but in Case 1 on the third, fourth, and seventh days lysis commenced in 0·45 per cent. salt solution, on the eleventh day in 0·35 per cent. salt solution, and on the fourteenth and eighteenth days in 0·4 per cent. salt solution. Lysis was invariably complete in 0·3 per cent. salt solution. It appears, therefore, that there was a tendency to some slight increase in resistance to hypotonic saline solution. In the experimental anæmias produced in animals by phenylhydrazine the red cells show an increased resistance to lysis in hypotonic salt solution (Muir). Taschenberg noted in his case that, with each successive course of treatment, more phenylhydrazine was required to bring about a reduction in the number of red cells, which reacted normally to hypotonic salt solution; he concluded that the red corpuscles acquired a special resistance to phenylhydrazine. No definite statement can be made about this, but Case 1 has had phenylhydrazine at intervals over a period of 16 months, and still reacts to suitable doses of the drug, provided it is fresh.

During the treatment of both patients the most remarkable change found in the urine was in its colour, which became very dark and at times almost black. The nature of this change is not understood. Urobilinogen was never found, and positive tests for urobilin were obtained only in Case 1 on three occasions—on the seventeenth, eighteenth, and nineteenth days after admission. There was a gradual increase in the output of urinary urea from 1·7 per cent. before treatment to 2·7 per cent. after treatment in Case 1, and in Case 2 the urea increased from 2·1 per cent. to 2·7 per cent.

Complications.

While in hospital, Case 1 became free from his symptoms as the red cells were reduced and no complications arose, despite the fact that he was allowed up while the phenylhydrazine was being given. He was dismissed on the twenty-second day feeling fit and well. The red cells at that time numbered 3·2 millions. No alteration was noted in the size of the spleen. Ten days afterwards he complained that his right ankle was swollen, red and tender, and the same thing occurred in the left ankle nine days later. At this time no phenylhydrazine was being administered. No phlebitis was observed, and the swelling and pain in the joints cleared up satisfactorily with a few day's rest. The red cells gradually increased until, on the ninetieth day after admission, they numbered 9·1 millions. He complained of flushing of the face, pains in the head, and tingling of the fingers. Fifteen ounces of venous blood were withdrawn, and he was given phenylhydrazine hydrochloride grs. 3 daily. A week afterwards the red cells were 6·1 millions, and the drug was continued until in another 18 days the red cells had fallen to 4·4 millions, when it was stopped. The red cells are again increasing, and it is anticipated that before long the patient will require another course of treatment. After treatment had been stopped, but while he was still in hospital, Case 2 developed a phlebitis in the right great saphenous vein on the twenty-ninth day after admission, when the red cells were 2·6 millions. This took some time to clear up, and he was not dismissed from hospital until one month later. When he reported ten weeks later the red cells numbered 5·7 millions, but he was keeping remarkably well and free from symptoms. No further doses of phenylhydrazine have yet been prescribed.

The above findings agree more or less closely with those reported from time to time by the other observers. Taschenberg, and Brown and Giffen mention the occurrence of thrombosis during treatment, but, as the latter writers also point out, thrombosis is common in cases of polycythæmia vera without treatment. It is a noteworthy fact that in Taschenberg's case and in our Case 2 there was a previous history of thrombosis and hæmatemesis. Brown and Giffen suggest that under treatment there is liberation of thromboplastic material which might predispose to thrombosis. In this connexion it is interesting to note the statement by Rosenthal regarding the blood-platelet factor and splenectomy. He points out the relationship between thrombosis and an increased platelet count in certain cases showing Banti's syndrome, and he mentions one such case in which, after excision of the spleen, the platelets rose to over 1 million and thrombosis supervened.

After this there was a diminution in the number of platelets. In Case 2 the platelets numbered 988,200 five days before the onset of the phlebitis; 13 days afterwards the platelets numbered only 217,200. Brown and Giffen also mention the possibility of a platelet factor being associated with thrombosis but, in three of their cases in which the blood-platelets were counted, the count was normal in two, while in the third the count was high at the beginning of treatment and gradually diminished to normal.

The question of possible damage to the liver from poisoning by phenylhydrazine is regarded as important by most of the other observers, mainly on account of lesions produced in the liver in experimental work on animals with hydrazine compounds, and also on account of the hepatic cirrhosis found on post-mortem examination in the case of polycythæmia reported by Levi, which had been treated with phenylhydrazine for one and a half years. But it is well known that cirrhosis of the liver may occur as a late complication in polycythæmia vera where no phenylhydrazine has been given. Levi considers that the cirrhosis is related to destruction of red cells, and that where phenylhydrazine is administered this destruction is increased and may hasten the onset of cirrhosis. Owen is inclined to regard the leucocytosis as an early sign of toxic damage to the liver cells, and therefore advises that treatment be discontinued if the leucocytosis becomes markedly increased. In the seven cases treated by Brown and Giffen, and in the two cases recorded above in which various tests of hepatic efficiency were carried out, no evidence of liver damage was found. Perhaps sufficient time has not yet elapsed to judge the effect of repeated courses of treatment, but Case 1, after six courses of phenylhydrazine within 16 months, shows no sign of hepatic inefficiency and, indeed, is now able to do light work as a night watchman.

Conclusion.

There seems to be no doubt that phenylhydrazine given by mouth is an effective agent in bringing about destruction of red cells. It is not known whether the destructive process is intracellular or extracellular in nature, but evidence of the hæmolytic effect of the poison is afforded by the increasing bilirubin content of the blood serum and the occasional appearance of urobilin in the urine. The action on the hæmopoietic system is not clear. From the experimental anæmias produced in animals phenylhydrazine appears to inhibit regeneration of the blood cells in some way. While that may be so, the data given above indicate, in the case of the erythropoietic system, an active regeneration rather than an inhibition. This is shown by the early appearance of reticulocytes, megalocytes, and polychromasia. Whether this activity is due to direct stimulation of the erythropoietic tissues, or whether it is secondary to the red cell destruction, cannot be definitely stated, but it is probable that the increased activity is a response to the demand for red cells to replace those destroyed by the phenylhydrazine. In common with many other drugs and poisons, phenylhydrazine seems able to call forth a leucocytosis, and this is thought to be due to some chemiotactic influence stimulating directly the leucoblastic tissues.

While the beneficial action of phenylhydrazine hydrochloride is only temporary, its use in the treatment of polycythæmia vera is justified by the feeling of well-being and the freedom from symptoms which it produces, always provided that its exhibition is controlled by frequent blood counts, and that it is discontinued when the number of red cells reaches the neighbourhood of 4·5 millions. While as yet there is no definite contra-indication, it must always be remembered that phenylhydrazine hydrochloride is a protoplasmic poison, and should be used, therefore, with care and respect.

I gratefully acknowledge my indebtedness to Prof. W. K. Hunter for permission to treat these two cases and publish the results. My thanks are also due to Dr. C. M. Fleming for her kindness in carrying out the blood nitrogen and blood cholesterol estimations mentioned in Table III.

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PITUITARY CACHEXIA IN A CASE OF TABES DORSALIS.

BY T. S. GOOD, M.A. OXF., M.R.C.S. ENG.,
MEDICAL SUPERINTENDENT TO THE OXFORD COUNTY AND CITY MENTAL HOSPITAL, LITTLEMORE;
AND
K. O. NEWMAN, M.D. VIENNA,
PATHOLOGIST TO THE HOSPITAL.

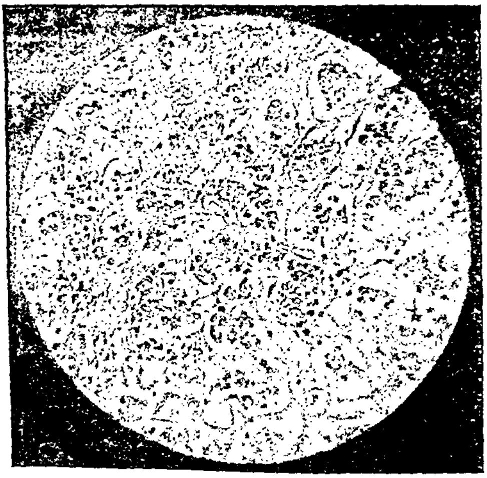
WITHIN recent years a great deal of attention has been paid to an affection of the pituitary gland, described as "Simmonds's disease," or "pituitary cachexia." The nosology of the glands with internal secretion is so complex and their physiology so incomplete, in spite of the overwhelming volume of literature on the subject, that a brief outline of Simmonds's disease seems justified. In 1914 Simmonds[1] described a case of total necrosis of the anterior, i.e., glandular part of the pituitary gland, caused by a post-partum septic embolus in the arterial supply of the lobe, which is separate from the supply of the posterior lobe. The most outstanding clinical feature was an extreme cachexia, accompanied by a senile aspect, loss of axillary and pubic hair, general nervous disturbances, and reduction in size of the abdominal organs (microsplanchnia). The atrophy of the anterior lobe can be caused by a variety of processes, such as compression through cysts and tumours, functional exhaustion through pregnancy, as claimed by Maresch[2] and Budde,[3] tuberculous infection, as described by Schlagenhaufer,[4] and, probably most important of all clinically, luetic affections. A number of cases of the last-named are reviewed by Jaffé,[5] and a general survey is to be found in the work of Kraus[6] and others. The symptomatology of the disease, excellently described by Redlich,[7] is very wide, though some salient features seem to be unmistakable. Trophic-vasomotor changes of the skin, as in myxœdema and sclerodermia, as well as in numerous cases total loss of teeth without caries, have been mentioned by Graubner,[8] Reye,[9] and Zondek.[10] Stress has been laid, as mentioned before, on the loss of hair under the armpits and pubic hair, as well as on the loss of hair on the trunk, while the growth of hair on the head and face remained unaffected. In our case there was a distinct loss of hair on the head, while the rest remained comparatively intact.

One might summarise the majority of symptoms under the heading of "hypofunction"; the pronounced muscular weakness, low body temperature, low blood pressure, and lowering of hæmoglobin, sometimes accompanied by marked eosinophilia. Lowering of basal metabolism, water- and mineral-metabolism, and particularly disturbances of sodium chloride excretion, are reported by various authors. Cessation of the menses in women and a premature senility in both sexes, caused by atrophy of the genital organs, are almost constantly described. The nervous and psychological symptoms are dominated by a certain torpor and apathy, very often coupled with marked sleepiness, which is, as repeatedly mentioned by Cushing, a frequent occurrence in pituitary tumours as well as after experimental removal of the pituitary gland. The neuropsychological symptoms are so marked and constant that such an experienced observer as Redlich (loc. cit.) tentatively suggests the term of "præhypophysial depression." Narcolepsy in Simmonds's disease has been described by Pennetti.[11] Jakob[12] has described two cases of Simmonds's disease where a careful histological examination of the brain failed to reveal any signs of the pathological changes of presbyophrenia or Alzheimer's disease, which tends to show a certain independence in the causation of the presenile changes.

The theoretical aspect of pituitary pathology is very controversial and complex and cannot be gone into here. Three separate possibilities and their combination seem to form the basis of an attempt to understand and explain the clinical pathology of the pituitary disorders: (1) The impairment of independent glandular activity of the pituitary gland, considered as a whole or in its parts—i.e., of anterior, posterior, and intermediate lobe. The anatomical and physiological existence of the last-named in man is doubtful and controversial. (2) The correlation and interaction of the effective pituitary gland within the system of glands of internal secretion. (3) The relation of the disease to the subthalamic centres in the mid-brain.

Several authors, like Biedl, Cushing, and others, hold that there is a close relationship between Simmonds's disease and the syndrome first described by the French as "insuffisance pluriglandulaire." Good therapeutic results from the ingestion of anterior-lobe preparations are claimed by Reye, Nonne, Lichtwitz, and others. Amongst the numerous contributions to the literature of the subject may be mentioned certain papers to which reference is made in the bibliography.[13-25]

FIG. 1.



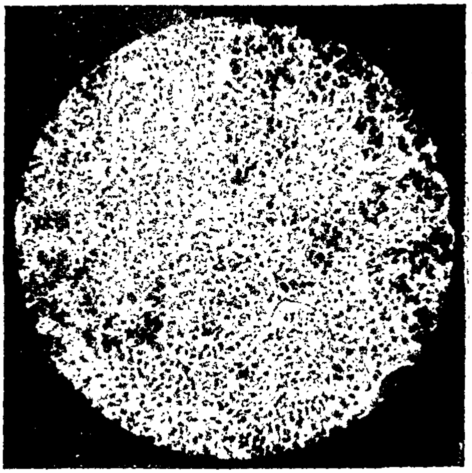
Section of anterior lobe of pituitary gland, showing fibrotic atrophy. Hæmatoxylin-eosin stain.

Report of Case.

A woman of 37 was admitted from Woodstock Workhouse Infirmary on Oct. 23rd, 1922. She was moody, sullen, and quarrelsome, threatened to "finish herself," got out of bed at night, and tried to get at the knives. She was stated to have been feeble-minded to a moderate degree since childhood and to have had illegitimate children. She became a charge to the workhouse. The family history was unobtainable. There was no history of miscarriages. At the time of admission no marked pathological changes were found in the internal organs. There was a slight parenchymatous struma and double optic atrophy. Both knee-jerks were absent and both ankle-jerks present. There was no light reaction in the pupils, and the Wassermann reaction was positive.

The depression seemed to clear up, and the patient became orientated and quiet, and her bodily condition improved.

FIG. 2.



Section of anterior lobe of pituitary gland of an abortive case of dystrophia adiposo-genitalis (Fröhlich's disease) with well-developed glandular tissue. Hæmatoxylin-eosin stain.

On March 23rd, 1924, she was discharged to the workhouse, whence she was readmitted on August 10th, 1927. She was then bedridden, and had apparently been very restless for some time. She said that "strong feelings came over her, and then for a time she did not know where she was," "that she intended to make away with herself." She had bedsores on the buttocks and a small abrasion on the outer aspect of the left knee. The knee- and ankle-jerks were absent, but there was no Babinski sign. There was marked ataxia. The globulin in the cerebro-spinal fluid, tested by Pandy's method, was + +, and the Lange gold-sol reaction gave a tabetic curve. She had shooting pains and gastric crises with repeated vomiting only relieved by morphia. She was very restless and agitated at times, and had persistent constipation. On Nov. 4th, 1927, she was inoculated with malaria by mosquitoes. On Nov. 19th she had her first rigor, and her temperature went up to 104° F. The second rigor was on Nov. 21st, when the temperature rose to 105° F. On Nov. 23rd she was given quinine, as her condition was not favourable to more rigors, and no more occurred. On March 26th, 1928, she showed no physical inprovement, had a series of abscesses on the buttocks, and was mentally very lethargic. A month later she was very emaciated and showed a progressive loss of hair from her head. She had an almost voracious appetite. On May 21st a perforating ulcer had developed on the right hip; on account of her extreme emaciation the capsule of the joint was exposed to view. There was also an ulcer on the left hip. On June 2nd she was weaker and incontinent, and on June 7th, at 3.55 A.M., she died.

Post-mortem Report.

Extreme emaciation. No external injuries. Perforating bedsores at both trochanters and along the proximal part of the pelvis. Skull symmetrical, eburnation of diploë, diameter about 8 mm. Almost complete ossification of sutures. Adhesion of dura mater to skull-cap. Pia-arachnoid thickened, adherent to convolutions. Convolutions flat, sulci shallow, more marked in fronto-parietal region. Consistence of brain and spinal cord softened, paste-like. Degeneration of posterior columns in spinal cord from beginning of sacral segments to lower cervical segments. Microscopically, besides loss of medullated fibres in posterior root-zones, marked endarteritis luetica throughout the central nervous system.

Adhesions at both pulmonary apices. Acute inflammatory process on the left lower lobe of the lungs with marked œdema. Heart not enlarged, tricuspid and mitral valve show some fibrotic changes, possibly of syphilitic origin. Several atheromatose plaques and one scar about 4 mm. in length in the arch of the aorta. Sclerotic changes in both coronary arteries. Fatty degeneration and partial atrophic changes in the liver. Gall-bladder normal. Bile-ducts patent. Atrophic changes in the mucous membrane of the stomach and intestine. Parenchymatous nephritis. Spleen slate-grey with perisplenitis, showing Malpighian corpuscles and increase of trabeculæ on cross-section; slightly enlarged. Pancreas and suprarenal bodies without marked changes. Parenchymatous struma to a moderate degree. Retrogressive changes of uterus and ovaries. Anterior lobe of pituitary gland (Fig. 1): very extensive fibrosis with consecutive reduction of glandular tissue to small irregularly scattered islets. Almost complete disappearance of eosinophil cells, basophil cells slightly increased, some "main" cells well preserved. Almost complete disappearance of vessels. Absence of colloid cysts in pars intermedia.

Posterior lobe: Apart from a slight gliosis and reduction in size, no pathological changes seen. Capsule irregularly thickened. Fig. 2 shows a well-developed anterior lobe for comparison.

Oppenheim mentions in his "Text-book of Nervous Diseases" (1913, vol. i., p. 186) that he saw two cases of tabes dorsalis in which, besides a local muscular atrophy, a striking general marastic (cachectic) condition was a feature, and adds that he feels justified in supposing, from his own experience, that general emaciation may be a symptom of the disease, that a rare form ("marantic tabes") exists which is characterised by an early, considerable general emaciation; he adds an illustration of one of his cases (Fig. 184). A spontaneous loss of teeth without caries in tabes dorsalis is also described in the same text-book (p. 181).

We venture to suggest that these are pituitary symptoms in the meaning of Simmonds's disease.

Summary.

The case considered on the whole shows a fairly typical course of tabes dorsalis. Within about three months of the patient's death rapid emaciation set in, which was *accounted for at the post-mortem* examination by a fibrous atrophy of the anterior lobe of the pituitary gland—Simmonds's disease. It is not unlikely that when more attention is directed to the possibility of this condition a greater number of cases will be clinically diagnosed. Attempts at organotherapeutic treatment seem to be indicated.

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DIGESTIVE ENZYMES OF THE HUMAN FŒTUS.

BY M. F. LUCAS KEENE, M.B., B.S. LOND.,
PROFESSOR OF ANATOMY AT THE LONDON (ROYAL FREE HOSPITAL) SCHOOL OF MEDICINE FOR WOMEN;
AND
E. E. HEWER, D.Sc.,
LECTURER IN HISTOLOGY AND ASSISTANT LECTURER IN PHYSIOLOGY AT THE SAME SCHOOL.

MANY observations have been made at various times upon the external secretions of the human fœtus, and the time of the first appearance of the different digestive enzymes is very variously quoted by different investigators,[1,2] many of whom have reported upon a few specimens only. As this problem is peculiarly one in which varying external conditions may vitiate the finding, the resulting experimental error in observation can be eliminated only by examining a very large series of cases under conditions as constant as possible. The present paper is based on the examination of 39 fœtuses, admittedly a small number, but dependable because only absolutely fresh material was used. The fœtus was considered as fresh only when received within 12 hours of birth, when it had died during or after parturition and not previously, and when on post-mortem examination it showed no autolytic change. Unfortunately no material suitable for enzyme-testing was obtained earlier than the sixteenth week, so that these observations extend only over the period from 16 weeks to full time.

Methods.

Histological.—*Material was fixed either in formalin* (5–10 per cent. in NSS), or formo-acetic Muller (formalin 5, glacial acetic acid 5, Muller's fluid 90), and embedded in paraffin wax. Sections were stained by Scott's hæmatoxylin and Biebrich scarlet, by Mallory's aniline blue-orange G mixture, and by Weigert's resorcin-fuchsin method. The sections were mounted in Gurr's neutral mounting medium or Canada balsam.

Chemical.—The fresh organ was quickly washed free from blood, chopped up finely, and extracted in about 10–15 times its volume of 90 per cent. glycerine in an incubator at 37° C. for 12 hours. The extracts were then filtered and tests were performed for various enzymes as follows. The quantities given represent the proportions and not necessarily the actual amounts used.

(*a*) *Amylase* (salivary and pancreatic). 1 c.cm. of 1 per cent. starch solution + 1 c.cm. extract (submaxillary or pancreas) + a trace of 1 per cent. sodium carbonate. Incubate at least two hours. Test with weak iodine for erythrodextrin.

(*b*) *Pepsin.* 1 c.cm. of 0·2 per cent. hydrochloric acid + 1 c.cm. extract (stomach) + washed fibrin. Incubate at least two hours; boil; filter. Test filtrate by xanthoproteic or Biuret test for proteoses.

(*c*) *Rennin.* 1 c.cm. milk that has been just brought to boiling-point and then cooled + 1 c.cm. extract (stomach) + trace of hydrochloric acid. Incubate at least one hour. Examine *for formation of curd.*

(*d*) *Trypsin.* Test as for pepsin, but using pancreas extract and adding 1 c.cm. K_2HPO_4 solution[3] instead of hydrochloric acid.

(*e*) *Erepsin.* Test as for trypsin but using duodenal extract.

(*f*) *Lipase.* 1 c.cm. of boiled milk + ½ c.cm. of 2 per cent. bile-salt solution, + 1 drop phenolphthalein, + 1 c.cm. extract (pancreas) + enough 1 per cent. sodium carbonate to render pink. Incubate at least two hours. Examine for neutralisation of alkali as shown by loss of colour.

(*g*) *Lactase.* 1 c.cm. of 1 per cent. lactose, + 1 c.cm. extract (duodenum). Incubate at least two hours. Test for glucose by Barfoed's test.

(*h*) *Invertase.* 1 c.cm. of 1 per cent. cane-sugar, + 1 c.cm. extract (duodenum). Incubate at least two hours. Test for glucose by Benedict's test.

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(*i*) *Maltase.* 1 c.cm. of 1 per cent. maltose + 1 c.cm. extract (duodenum). Incubate at least two hours. Test for glucose by Barfoed's test.

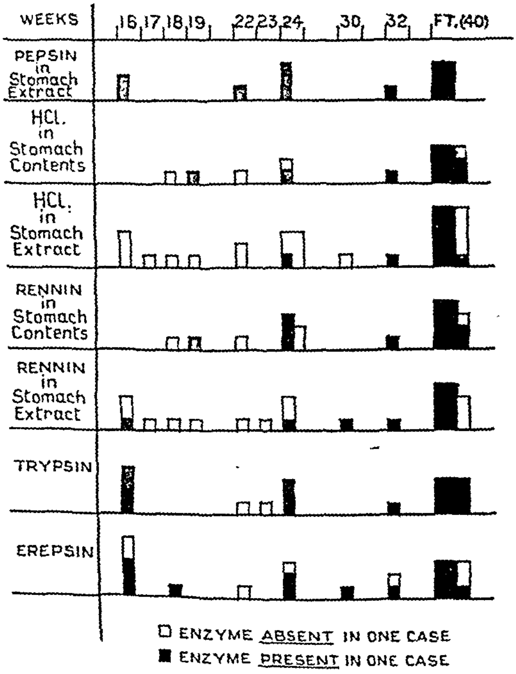
In every case a control experiment was carried out, the organ extract being first boiled. In addition, hydrochloric acid was tested for by Günzberg's test. Some tests were carried out for the presence of enterokinase and trypsinogen, but the method appeared to us open to criticism, and the results are not here recorded. In a few cases the contents of the stomach were pipetted off and tested separately, an extract being subsequently made of the washed gland, and also tested.[4]

Salivary Glands, Stomach, and Small Intestine.

Ptyalin (salivary amylase) was tested for in 19 cases, from 17 weeks upwards; its presence was detected in 5 only out of 12 full-time fœtuses. No trace was found in earlier extracts (see Chart 2). No chemical tests were carried out for the other constituents of saliva, but from the microscopic structure of the glands mucin was probably present. Definite mucin-secreting cells are found at 24 weeks, and the ducts contain a basophil mucin-like material. Previous to this (16 weeks) a similar material is seen in the lumen.

Pepsin was found in every case tested—namely, 13—varying from 16 weeks up to full time. Rennin was found in the gastric contents in 18 out of 23 cases, the earliest being 19 weeks. In the extract of the mucous membrane rennin was found in 12 out of 24, once at 16 weeks, and then not until 24 weeks (see Chart 1).

CHART 1.

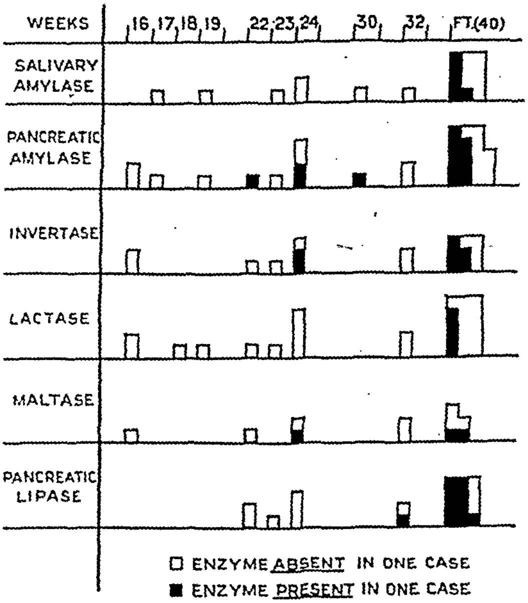


Hydrochloric acid, as tested by Günzberg's reagent, was found in the stomach contents (15 specimens), the earliest at 19 weeks, and eight out of nine times at full time. In the extract hydrochloric acid was not found so early, being present first at 24 weeks (once out of 14 tested up to and including this age); at full time it was found in 11 out of 15 specimens (see Chart 1).

These findings are borne out by the microscopical appearance. Though the gastric glands have begun to develop by the eighth week, differentiation of the cells first occurs at 16 weeks. At this age three types of cells can be clearly distinguished: (*a*) some containing mucin; (*b*) some large oval cells staining red with Biebrich scarlet and lying in the deeper parts of the glands, probably oxyntic cells; (*c*) smaller granular cells in the outer part of the glands, probably peptic cells.

Erepsin was present in extracts of the duodenal wall in 15 out of 22 cases, and was actually found in three out of five specimens of 16 weeks (see Chart 1). The sugar-hydrolysing enzymes were all present at birth, although inconstantly; invertase and maltase were also found at 24 weeks, but not previously (see Chart 2). We think that our failure to detect these ferments at earlier ages may be due to their relative instability. The presence of well-marked goblet cells in both villi and crypts at eight weeks suggests that mucin is probably present at this age, though tests for mucin were not actually made.

CHART 2.



Pancreas and Liver.

Pancreatic amylase was found in extract of pancreas in 13 out of 31 cases, the earliest at 22 weeks, but it is to be noted that it was not present constantly at full time (see Chart 2). Pancreatic lipase (20 cases) was found in 14 specimens, once at 32 weeks. Trypsin (17 cases) was present from 16 weeks, except in two specimens (22–23 weeks) (see Chart 1). The test for trypsinogen and enterokinase was not considered very satisfactory, and the results are therefore not included. Microscopically the islets were first detected at 75 mm. (10–11 weeks). By 12 weeks the islets were well differentiated, and the alveolar cells were strongly eosinophil and granular.

No chemical tests were carried out for the presence of bile-salts or mucin—i.e., the liver secretory products concerned in digestion. The anlage of the gall-bladder was seen in the 10 mm. embryo. Bile-ducts were first clearly seen at 12 weeks.

Discussion.

There are many difficulties in assessing the results of this investigation. There is, in the first place, little or no exact knowledge of the conditions present in the still-born fœtus effecting alteration or even destruction of bodies so unstable as enzymes, though it is known that certain factors are at work. For example, it is known that changes of hydrogen-ion concentration occur rapidly after death, and further, that these variations materially affect the activity of enzymes, but the exact influence of such changes on specific ferments is not known. Just as there are variations in the rate at which post-mortem changes occur in different organs, so also alterations of hydrogen-ion concentration and other post-mortem conditions may effect certain enzymes more rapidly than others, and thus it is probable that a negative finding is of less value than positive evidence.

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[4] A large number of these tests were kindly carried out for us by Miss D. Woodman, M.Sc.

Following up this line of argument, we submit that the carbohydrate-splitting ferments may be more unstable after death than the proteolytic enzymes, otherwise it is most remarkable that the latter are present as early as 16 weeks, whilst the former are not constantly found even at full time. In addition, contrary to expectation, there is very little correlation between the appearance of pancreatic amylase and intestinal maltase. Hydrochloric acid, though not present as early as pepsin, was fairly constantly found at birth. It is suggested in this connexion that both our own varied results and the inconstant findings of other workers may be due to post-mortem decomposition of the hydrochloric acid, or to vitiation of the Günzberg reaction owing to the presence of mucin.

Summary.

1. Proteolytic ferments present at 16 weeks. 2. Hydrochloric acid present at 19 weeks. 3. Rennin present at 19 weeks. 4. Pancreatic lipase present at 32 weeks. 5. Carbohydrate-splitting ferments found very rarely at 24 weeks and not constantly at full time. [No tests were carried out on material younger than 16 weeks.]

This research is part of a general inquiry into fœtal development, the expenses of which are being met in part by a grant from the Thomas Smythe Hughes Medical Research Fund.

Clinical and Laboratory Notes.

A NOTE ON
BANISTERINE OR HARMINE.

By J. A. Gunn, M.D., D.Sc.,
PROFESSOR OF PHARMACOLOGY IN THE UNIVERSITY OF OXFORD.

About a year ago Lewin [1] published results of an investigation of the actions of *Banisteria caapi* and of the alkaloid banisterine obtained from it. Extracts or decoctions of this plant have been used by natives of South America as a kind of intoxicant. From experiments on laboratory animals and on man, Lewin found that banisterine produced a stimulation of the central nervous system, followed, in the case of larger doses especially, by depression. On the basis of his experiments the alkaloid was tried in post-encephalitic rigidity with results said to be equal, or superior, to those obtained by the use of hyoscine in the same condition. At the end of this investigation Lewin was informed by Merck that the alkaloid banisterine was chemically identical with harmine. Both possess the same formula, $C_{13}H_{12}N_2O$. Lewin was able, from the literature on harmine, to adduce as points of agreement only the heightening of motor excitability up to convulsions, and stated that further experiments were necessary to establish the identity of banisterine and harmine.

At a recent meeting of the Berlin Medical Society, Lewin and Schuster [2] reported the results of the use of banisterine in cases especially of Parkinsonism. In the subsequent discussion Stern mentioned that he had employed harmine in a few cases with success, but Lewin did not admit the identity of action of harmine and banisterine. In a comment on the problem in THE LANCET it was stated that it is essential that a—

> "Pharmacological comparison of banisterine and harmine should be instituted as soon as possible. The point is important, because if Prof. Lewin's results are confirmed a demand may arise for this drug, and harmine can probably be made much more easily from the usual source, the seeds of *Peganum harmala*, than from the plant utilised by Prof. Lewin, *Banisteria caapi*."

Many years ago I carried out a somewhat detailed investigation of the pharmacological actions of the two alkaloids of *Peganum harmala*, harmaline and harmine. As the results of this investigation were published in the *Transactions* of the Royal Society of Edinburgh—a publication which is not usually searched for work of this kind—it is perhaps not surprising that neither Lewin nor anyone as far as I know, who has worked on banisterine or harmine, seems to be acquainted with my papers. As the result of data already to hand, it would seem possible to institute a comparison of banisterine and harmine from the pharmacological viewpoint; indeed, what difficulty there is arises from lack of detailed knowledge of the actions rather of banisterine than of harmine. As I have been investigating during the past year the actions of the nearly related tetrahydroharmine, in the course of which I have repeated many of the experiments with harmine and harmaline, I feel in a favourable position for making a comparison between the actions of banisterine and harmine upon the basis of such knowledge of the two alkaloids as is at present available.

The actions of the alkaloids of *Peganum harmala* were first investigated in 1895 by Tappeiner.[4] He gave a general account of the actions of harmaline—e.g., the motor stimulation of the central nervous system (tremors and convulsions), followed or accompanied by paresis; he described the slowing of the pulse, and he roughly estimated the lethality in laboratory animals. He also made a few experiments with harmine which acted very similarly. His investigation was stated to afford no basis for the therapeutic use of the alkaloids.

Some years later I described in greater detail the actions of harmaline [5] and harmine,[6] as a result of which I came to the conclusion that the actions of these alkaloids generally resemble those of quinine but that, in regard to the stimulation of the central nervous system, their actions resembled those of some of the other cinchona alkaloids rather than of quinine itself. On the basis of these experiments, harmaline and harmine were tried in malaria,[7] with the result that the former was found to have curative results in acute malaria, though inferior to quinine, but harmine gave promising, though (owing to the small number of cases available) not convincing, results in relapsing malaria. Flury [8] also investigated the actions of the harmala alkaloids, with very similar results so far as the nervous system and circulation were concerned.

In regard to my own position, further experience has confirmed my belief that there is a remarkable resemblance in their fundamental actions between the cinchona alkaloids and the harmala alkaloids. This is true, for example, of their actions on protozoa, on voluntary muscle, on the circulation, and on organs containing involuntary muscle—e.g., the uterus, spleen, intestine, blood-vessels. Unfortunately, no sufficiently detailed examination of such actions of banisterine has yet been done, but I should suggest to those who can obtain banisterine for investigation that if the latter possesses the following actions it would go far to establish the pharmacological identity of this alkaloid with harmine: produces contracture and inexcitability of frog's muscle in a concentration of 1 in 5000 or greater; contracts frog's blood-vessels; contracts the rabbit's uterus in concentrations of 1 in 20,000 or greater; relaxes the spleen and intestine; has a powerful toxic action on protozoa. If banisterine proves identical with harmine these actions will have to be kept in mind in its therapeutic employment.

In the absence, however, of detailed information of the pharmacological actions of banisterine, it is, I think, still possible to institute a useful comparison between the actions of the two alkaloids. In attempting to do this, I propose to direct special attention to their actions on the central nervous system, seeing that it is for this use that banisterine has so recently acquired its reputation.

It is in the first place interesting that both plants sources have been used to form a kind of intoxicant. Lewin has given an interesting account of this use of *Banisteria caapi*. I drew attention to the use of harmala seeds as an intoxicant in North Africa, with the comment[7]: "It is possible that in large doses it (harmine) will produce a kind of intoxication in man, seeing that it has been found to produce a pronounced stimulation of the cerebrum in the lower animals." Vertigo and nausea and slowing of the pulse are described as symptoms occurring in man with banisterine, and they occur also with the harmala alkaloids.

In laboratory animals, the action of the two alkaloids can be more easily compared. Lewin gives the minimal lethal dose of banisterine for guinea-pigs as 0·1 g. per kg., practically identical with what I found for harmine—viz., 0·12 g. per kg. In the rabbit he found banisterine caused death in a dose of 0·2 g. per kg. in 3–6 hours, while I found death from 0·23 g. per kg. of harmine in 2 hours 40 minutes. So far as lethality goes, the results are sufficiently near to allow the alkaloids being identical.

Lewin describes the symptoms produced in the rabbit by banisterine, and the closeness of the resemblance between that description and the effects of harmine in the rabbit as I described them is remarkable, as the following extracts will show.

Banisterine (Lewin).—Two minutes after injection the whole body trembled, the fore limbs were kept stretched in front. After seven minutes, short-lasting rotation movements round the long axis of the body followed. The animal lay down and made drum-beating movements with the fore limbs. (This was followed by a condition of stupor.)

Harmine (Gunn).—Five minutes after injection there were marked tremors of the head and fore part of the body and the hind limbs were extended so that the abdomen touched the ground. After 12 minutes a slight epileptiform convulsion occurred, after which the animal lay quiet. A similar but more violent convulsion occurred later during which the animal fell on its side and rolled over sideways two or three times. After this the rabbit lay on its side with feeble pawing movements of the limbs. (This was followed by a condition of motor paresis.) Considering that the dosage was different, the qualitative resemblance in the symptoms selected for mention is at least very striking.

No one could read the descriptions of the effects of the two alkaloids without being impressed by the resemblance. The chief symptoms produced by both are tremor and swaying of the body, with impulse to continual movement, especially "running" movements or "drum-beating" movements of the fore limbs. The tremor is aggravated by voluntary effort. With the related alkaloid harmaline I deduced from the symptoms the occurrence of hallucinations in cats, just as Lewin did with banisterine in dogs. So far as mammals are concerned it would seem impossible, on the present data available, to distinguish the actions of the alkaloids. Harmine produces slightly different symptoms in different species of mammals. A more exact comparison could be made by comparing parallel doses of the two alkaloids in different species of animals. The lethality of harmine for several species of animals has already been determined.[6]

The only apparent discrepancy is in regard to the frog. In a very brief account, Lewin describes a persistent heightened reflex excitability followed by paralysis of the extremities. The animal assumes a peculiar attitude in which the head is immovable as if in long-lasting opisthotonus, a posture which is not altered by death. On the other hand, I found no convulsive symptoms with harmine in frogs, but only paralysis of lower motor centres. Flury likewise found no convulsive symptoms with harmine. I did, however, point out the rigidity of the back muscles, ascribing it, I think rightly, to the local action of the injection into the dorsal lymph sac. I had found that solutions so low as 1 in 5000 produced rigid contracture of frog's voluntary muscles, and the hypodermic injection being much more concentrated very markedly produced this effect on the muscles of the back. Unfortunately no data are available in regard to the action of banisterine on frog's muscle. It appears to me, however, that Lewin may have confused such an action with a strychnine-like opisthotonus. Indeed, the fact that the posture was unaltered after death renders this local action almost certain.

Perhaps these points may suffice for the present to emphasise the extraordinary close resemblance between the pharmacological actions of banisterine and harmine. If the alkaloids prove to be identical, the fact does not of course detract from Lewin's initiative in being the first to employ banisterine in paralysis. Having exhausted my supply of harmine, I have not been able to try it in post-encephalitic conditions but I hope soon to have an opportunity of doing so. If harmine, whether identical with banisterine or not, proves of value in nervous diseases, the question will arise whether any of the allied alkaloids may not be even better. It is difficult to prophecy in view of the fact that the exact cause of the rigidity in Parkinsonism is not determined. If the beneficial effect is due to a stimulant action then harmine will possibly be superior to harmaline and possibly inferior to apoharmine. I hope to publish very soon a detailed account of the action of tetrahydroharmine.

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THE PRESERVATION OF ANÆSTHETIC ETHER.

BY C. LANGTON HEWER, M.B., B.S. LOND.,
ANÆSTHETIST AND DEMONSTRATOR OF ANÆSTHETICS,
ST. BARTHOLOMEW'S HOSPITAL, LONDON.

IT has been recognised for many years that anæsthetic ether, when stored, tends to oxidise and that peroxides, aldehydes, and other substances make their appearance. Furthermore, these decomposition products have been shown to be toxic and some even think that "ether convulsions" are due to their presence.[1] Organic chemists have done a great deal of work in trying to find means of checking this decomposition and their efforts have met with a large measure of success. In 1921 it was shown that carbon dioxide had a stabilising effect upon ether,[2] and many manufacturers both in this country and in the United States now treat their product in this way before it is bottled. Strong light and heat have also been shown to favour decomposition, and most ether is now put up in dark amber-coloured bottles with instructions for storing in a cool place.

Anticatalysts.

In spite of these precautions, however, ether still tends to oxidise when kept for prolonged periods, and efforts have been made to find a suitable anticatalyst which will inhibit this action. The addition of a small quantity of alcohol has been tried,[3] but this was not so successful as it was in the case of preserving chloroform. Metallic mercury has a slight but definite anticatalytic action, the most efficient form being that of "grey powder" which has a larger effective surface than the equivalent amount of metal in the form of a globule. It has recently been shown, however, that copper is a most excellent anticatalyst and that ether stored in copper cans shows no tendency to decompose even in the most adverse circumstances.[4] It seems probable, therefore, that the storage problem is solved, and that in the near future ether will be put up in containers which are internally copper-plated.

The next difficulty to be overcome is the decomposition of ether through which gases are bubbled. At the present time many types of anæsthetic apparatus exist in which air, oxygen, or nitrous oxide and oxygen are passed over or through ether, and it is notorious that oxidation occurs very quickly under these conditions. Dr. C. F. Hadfield investigated the contents of the ether bottle of a sight-feed apparatus through which nitrous oxide and oxygen had been passed.[5] He found that decomposition varied with different ethers and was accelerated by heating the bottle. Furthermore, the figures for the aldehyde and peroxide contents showed marked correspondence. It occurred to me that it might be possible to utilise the anticatalytic property of copper already referred to, and thus inhibit the oxidation brought about by the passage of gases through ether.

Author's Experiments.

Accordingly, a polished copper plate about 8 cm. long and 3 cm. wide, giving an effective surface of about 48 sq. cm. was placed in the standard ether bottle of a Boyle's apparatus. Approximately one-third of the surface of the copper was above the ether level. This latter was kept fairly constant by the addition of fluid at frequent intervals. The ether used was the purest standard product obtainable, and nitrous oxide and oxygen in the proportion of 5 to 1 were bubbled through it for varying periods. The ether bottle was surrounded by a jacket containing water at room temperature and was exposed throughout to a strong artificial light. The experiments were then repeated without the copper plate and the various samples were analysed with the following results:—

Time of bubbling $N_2O + O_2$ in minutes.	Ether peroxide (parts per million).	
	Without copper.	*With* copper.
0 (control) ..	Less than 0·05	
30	2·5	1·2
60	2·2	0·2
90	1·0	0·5
	Aldehyde (parts per million).	
0 (control) ..	1·0	
30	9·5	2·5
60	11·5	2·5
90	4·0	1·5

This appeared to show that a copper plate does materially diminish oxidation, and it was next decided to find out whether the actual tube which dipped into the ether could be made of copper and produce similar effects. A copper sheath 5 cm. long was therefore made and fitted over the end of the bubbling tube. On repeating the analyses, however, it was found that the rate of oxidation was not changed from that of a standard control. This negative result was thought to be due to an insufficient area of copper above the ether level and another tube 9 cm. long was made giving a total effective surface of about 56 sq. cm., of which about one-third was above the ether level. The series of experiments was then repeated, the analyses reading as follow:—

Time of bubbling $N_2O + O_2$ in minutes.	Ether peroxide.	Aldehyde.
	Parts per million.	
0 (control) ..	0·05	1·5
30	0·05	2·0
60	0·05	5·0
90	0·05	5·0

These results show that practically no oxidation had occurred and that the previous supposition was correct in that an adequate surface of copper must be present above the ether level to secure the best results.

In studying these analyses it may be noticed that in some cases the amount of impurities found after 90 minutes passage of gases is less than that after 60 minutes. This curious result was also observed in the similar but much slower oxidation which occurs with stored ether.[4] It is found that ether kept for two years usually contains less aldehyde and peroxide than that stored for only six months. The probable explanation is that further decomposition takes place and that traces of organic acids are left as the end-product of the reaction.

Conclusions.

1. Pure ether treated with carbon dioxide and stored in copper containers will keep pure almost indefinitely.
2. If anæsthetic gases are bubbled through ether for prolonged periods the rate of decomposition will be greatly diminished if there is an adequate area of copper above and below the ether level.

My thanks are due to Mr. F. H. Carr, F.I.C., who arranged for the chemical part of this investigation to be carried out at the British Drug Houses Analytical Laboratories.

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NOTE ON THE

INHIBITORY EFFECT OF A STAPHYLOCOCCUS ANTIVIRUS IN RELATION TO THE pH OF THE MEDIUM.

BY R. F. HUNWICKE, B.SC. LOND., A.I.C.,
BACTERIOLOGIST, GLAXO RESEARCH LABORATORY, LONDON.

Louros and Gaessler (*Klin. Woch.*, 1927, vi., 1662) have stated that the inhibitory effect of a streptococcus antivirus is due merely to the development of acidity in the medium. They found that the filtered broth culture of a streptococcus had a hydrogen-ion concentration corresponding to a pH of 5·0 to 5·8, and point out that streptococci cannot in any case live in this medium because of its high acidity. Further, they found that streptococci would grow in the filtered broth as soon as it was neutralised with a phosphate buffer solution. They therefore question the existence of a streptococcus antivirus. The following experiment shows that the conclusions of Louros and Gaessler do not hold in the case of a staphylococcus antivirus.

A 500 c.cm. flask of ordinary peptone broth, standarised colorimetrically to a pH of 7·8, was inoculated with a mixed culture of eight strains of staphylococci which had been isolated from the pus of various lesions. The flask was incubated at 37° C. for 36 days. The culture was then filtered through a Berkefeld filter and the filtrate was reinoculated with the same mixed culture of staphylococci and incubated at 37° C. Slight initial growth occurred, but it did not increase macroscopically after 48 hours. The incubation was continued for 17 days, and the culture was then filtered through a Berkefeld filter. The pH of the filtrate was determined electrometrically and found to be 8·6 (two determinations).

To 10 c.cm. of sterile filtrate was added one loopful of pus from which staphylococci had previously been isolated. No trace of growth occurred. In a control broth, similarly inoculated with pus, there was abundant growth of staphylococci.

Further experiments have shown that final sterilisation of the filtrate by steam on three successive days has no effect either on the hydrogen-ion concentration or on the inhibitory power of the filtrate. In one such experiment the pH of the heat-sterilised filtrate was found to be 8·1. Ten cubic centimetres of this filtrate when inoculated with one loopful of a young mixed culture of staphylococci showed only a trace of initial growth, which ceased after 24 hours' incubation.

It is evident, therefore, that the inhibitory effect of a filtered broth culture of staphylococci is not due to the development of acidity in the medium.

Medical Societies.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.

AT a meeting of this Society on April 5th Dr. F. J. COUTTS, the President, took the chair and a discussion on

VENEREAL DISEASE IN THE MERCANTILE MARINE

was opened by Dr. H. M. HANSCHELL. His experience, he said, had left with him the deep impression that the seafarer, sailing in and out of the Port of London, was anxious to secure expert medical advice and treatment for his venereal disease, and without loss of time. In the sailor these diseases differed in no particular from those of the landsman. The latter had attended in considerable numbers at the clinic which he had had charge of for ten years, and therefore he was in a position to make comparisons. He had had under care for these diseases about 7000 male patients of every nationality, creed, and shade of colour. The recently noted decrease in the incidence of primary and secondary syphilis applied to both seamen and landsmen. More than half the white seafaring men patients he saw acquired their infection in England, and for the most part in London. Most of them got it from prostitutes whom they paid, as also did the majority infected at ports abroad. An increasing proportion of men, he found, sought advice because they feared an unhappy result from their last coitus; of 700 white seamen so attending 124 were found not to have venereal disease. The ages of the infected seamen he saw ranged from 18 to 27. In his last 700 consecutive white cases 10 were infected in North America, 32 in Australasia, 52 in South America, 83 in the Far East. Liverpool figures would probably show different proportions. Of the last 900 consecutive seamen he had seen, 200 were either Asiatics or negroes. Venereal diseases were carried from country to country far more by passengers than by those who worked the ships, and it was not so easy for the latter to hide their disease. Examination of passengers had not yet been extended to include the genitalia, but crews for ships in British ports had to pass a medical examination before they could sign on for another voyage. The majority of seamen in this country were so examined two or three times a year. Stewardesses were medically examined, but not their genitalia. Doubtful cases found during the ordinary medical examination were sent to the clinic, but many of these turned out not to be venereal disease, and though there had been delay in reaching the diagnosis so that a man lost his chance of signing on a ship, no complaint was made. The man was given a certificate to this effect, and this absolved him from a further examination. Dr. Hanschell suggested that some such close working connexion between the venereal diseases clinic and the medical examination of the crews before signing on was necessary; the clinic should be near where the signing on took place, and should not be restricted as to hours. Sometimes disease became manifest on the voyage though it had not been detected at the medical examination.

There was considerable variation, said Dr. Hanschell, in the equipment and capacity of ships' surgeons. Some had not had any first-hand experience in the modern technique of diagnosis and treatment of venereal disease, and comparatively few ships carried proper irrigation apparatus, or such drugs as salvarsan and bismuth. This was a reflection of the neglect of adequate teaching on the subject in the medical schools, but improvement in this respect was now evident, and it was not so seldom that patients came to the clinic armed with careful notes of their case. He believed that most steamship lines had a waiting-list of applications for the post of surgeon, and it would be easy to insist that applicants should produce evidence of capacity to diagnose and treat these diseases by modern methods. Clinics had had an educative effect on even lay members of the crew, and when no surgeon was on board it was clear that treatment was conducted on sound lines. When on shore the men did not delay in seeking advice. Seamen suffering from these diseases did not wish to go home; they asked to be treated at hospital. And they were becoming more fastidiously conscious of their responsibility for the spread of venereal disease. He pleaded for a better education of ships' surgeons in this matter, and more modern and adequate equipment. The great aim should be to prevent cases of venereal disease going on board ship.

Dr. A. O. ROSS (Liverpool) drew a vivid picture of the relaxations awaiting the returning seaman at the ports, conspicuous among which were the opportunities, especially when in drink, of promiscuous sexual congress. Few seamen, he found, continued the treatment until they were cured; some were even too lazy to read the instructions. Institutes existed at Liverpool which catered for the men's amusement and many efforts were made on their behalf. He criticised the poor accommodation for the crews on many ships, even important ones, remarking that several foreign countries set Britain a good example in this regard. He had come to the conclusion that until there was better discipline and the men were provided with more generous accommodation on board ship a serious incidence of venereal disease would continue. In a large series of cases Dr. Ross said his proportions for the different venereal diseases worked out as follows: gonorrhœa, 61 per cent.; syphilis, 29 per cent.; chancroid, 10 per cent. He added that 15 per cent. of the patients at his seamen's clinic were Liverpool townspeople, who found it more convenient to go there than to attend clinics nearer home. South American ports he stigmatised as plague spots in regard to venereal disease, the cases coming from them grossly exceeding (taking into consideration the tonnage concerned) those from any other part of the world. On the other hand, he had high praise for the efficiency of the treatment carried out at Singapore. Of 3000 cases in his clinic 18 per cent. were foreign. Acute cases he persuaded to sign off their ship. Chronic cases were allowed to sail again under promise to renew treatment on their return. For gonorrhœa he thought adequate treatment could only be assured with certainty ashore. Many seafaring men did not regard this disease with any particular seriousness; some indeed were contemptuous about it.

Discussion.

Dr. H. WANSEY BAYLY said most seafarers were of the virile type, who would not be dissuaded from satisfying their sexual instinct, hence prevention should be concentrated upon by giving instructions as to cleanliness and disinfection when risk had been encountered. Measures of this kind in certain ships of the Navy had proved most effectual.

Dr. M. T. MORGAN spoke of the work of a committee of the Board of Trade in the direction of revising the scales of drugs and medical appliances to be carried by various classes of ships. Similar attention had been paid to the medical guide for captains whose ships did not carry a surgeon; and the next subject to which the committee would direct its attention would be the scales for ships carrying a surgeon.

Mr. J. F. PEART referred to the great value of the treatment of gonorrhœa by argyrol.

Dr. JOHN ADAMS spoke of the rarity of cases of chancroid in London nowadays as compared with 40 years ago. He considered that very often surgeons on board ship were inadequately trained for dealing with cases of venereal disease, and insufficiently equipped. There should be a more thorough training of medical men attending clinics for instruction; they should actually do the injections under expert supervision, in order to gain confidence.

Colonel L. W. HARRISON said that the papers by Dr. Hanschell and Dr. Ross, as also remarks by Dr. Adams, confirmed the opinion which he had held for a long time that the regular treatment of a man of the mercantile marine suffering from venereal disease could be secured only by his remaining ashore. It seemed rather hard that a seaman should have to remain ashore so long, and he thought the remedy lay not only in ships being better equipped in material for the modern treatment of venereal disease, but in ships' doctors being better trained to use this equipment. Whatever might be thought about the practicability of continuing afloat treatment commenced ashore, there was no escaping the necessity of accurate diagnosis and skilled treatment of men whose disease began on the voyage. His own experience led him to believe that this was by no means always satisfactory, and he could endorse what had been said about the frequency with which sores had been treated with lotio nigra, or other antiseptics, before microscopical diagnosis had been made. He was particularly glad, therefore, to support Dr. Hanschell's suggestion to take advantage of the numbers of candidates for the post of ship's doctor by insisting on these previously undergoing a post-graduate course of instruction in the modern diagnosis and treatment of venereal disease.

Mr. JONES (National Union of Seamen) and Rev. Mr. DEMPSEY (British Sailors Society) urged the need of prevention, and spoke of the provision being made to entertain the men when they came ashore. Mr. Dempsey thought that one of the greatest assets on the part of the medical man encountering these cases was the adoption of that kindly attitude towards the sufferer.

Commander CAVILL (R.N.R.) praised the efforts being made by various societies on behalf of seamen, and said a real need was the education of the public, land as well as seafaring, to the seriousness of these diseases.

The PRESIDENT agreed that centres for the treatment of seamen ought to be quite near the docks, otherwise the proportion coming for treatment would not be satisfactory. Apparently some of the clinics were so well and considerately conducted that the men attended faithfully. He feared there was much truth in the contention that the only way in which to treat sailors in an effective way was to treat them ashore; but he would not like to think that would be so in the future, as he hoped that when the man went back to sea he would be able still to have proper treatment. He hoped a firm stand would be made in the way of ensuring that doctors appointed to ships should be qualified to treat these diseases properly, and have the equipment which would enable them to do this.

Mrs. NEVILLE ROLFE asked what medical provision could be made for the large number of men engaged in the coastwise trade of the country and those in fishing fleets. Both these classes of men were a long time from home and were in the way of acquiring disease in consequence, and she asked how their treatment needs could be at present met in such places as Fowey and Lowestoft. She also asked whether difficulty was experienced in inducing British seamen to go to foreign clinics for treatment.

Dr. HANSCHELL, in the course of his reply, said he did not think the classes of men mentioned by Mrs. Rolfe (in which he included men working the Thames Estuary) received treatment at all. Yet, if the disease were diphtheria instead of syphilis, hospital accommodation would be quickly found for them.

Dr. ROSS also replied. He agreed that the coastwise men were badly treated in regard to venereal disease. There did not seem to be a V.D. clinic for seamen at Bremen, but cases there were passed on by the British Consul to a practitioner who made the necessary injections at a trifling charge beyond the cost of the drugs.

ROYAL SOCIETY OF MEDICINE.

WAR SECTION.

A MEETING of this Section was held on April 8th, with Lieut.-General Sir MATTHEW FELL, the President, in the chair, to discuss

FUNCTIONAL NERVOUS DISORDERS IN THE SERVICES.

Colonel J. C. KENNEDY said the discussion originated in the fact or belief that during the last few years the incidence of hysteria in the Army had been increasing. It was not surprising that many men should have broken down under the strain of their war experiences, but under normal circumstances hysteria was not looked upon as of much importance among disorders of the male. He was sure, however, that in this time of peace, hysteria existed to a quite appreciable extent. In the five years before the war cases of disease of the nervous system were estimated at 5·7 per 1000 strength, in which the figure for hysteria was 0·1, neurasthenia 0·6, and epilepsy 0·9. In 1927, on the other hand, nervous cases amounted to 7·5 per 1000, with hysteria 0·7, neurasthenia 1·4, epilepsy 0·9. Colonel Kennedy analysed 177 cases occurring during the 18 months following Jan. 1st, 1927. In a few the diagnosis was uncertain, the reasons being: (1) that clinical details were lacking, and so the cases had to be excluded; (2) that the men were suspected of malingering; or (3) that there was some associated condition, such as high blood pressure or duodenal ulcer, or a possibility of organic nervous disease such as encephalitis lethargica or disseminated sclerosis. No case should be diagnosed as hysterical when the symptoms were associated with the presence of an organic abnormality. The 154 cases left, out of the 177, when doubtful ones had been excluded, were grouped according to the main clinical symptoms: (*a*) those in which fits or convulsions were the main symptom, of which there were 82; (*b*) those in which tremors or spasms were predominant, 10; (*c*) those presenting paralyses, disturbances of sensation, and aphonia, 19; (*d*) those with mental symptoms (including amnesia) predominating, 43. Patients in the first group were admitted to hospital for observation of a fit, which might be simply an attack of vertigo, a fainting attack, or an epileptiform seizure. There was a high incidence of these cases in the first two years of service, showing that there had probably been some inherent defect in the person. Young adults during a first experience of a hot climate, if subjected to physical or mental stress, especially if associated with over-indulgence in alcohol, might throw epileptiform fits which were indistinguishable from those of true epilepsy. In group (*b*) tremor and spasm, a history of nervous disability in youth or before enlistment was pronounced. In group (*c*) Colonel Kennedy had noted the power of suggestion, several cases of aphonia having occurred in series. The mental group (*d*) constituted nearly one-third of the total number. The illness was characterised by great irritability and loss of self-control, episodic attacks of delirium or frenzy, and exaltation and depression. Somnambulism, hallucinations, double personality, amnesia, and craving for sympathy were also seen. It was not uncommon to get a history of uncontrollable temper, and in two cases chorea had occurred early in life. There was much evidence that the basic factor in hysteria was a constitutional or inherent instability of the nervous system. These cases afforded ample illustration of Babinski's contention that hysteria was the outcome of suggestion, and that it could be cured by counter-suggestion and persuasion. The manner of disposal of the patients was recorded in 151 instances; 113 men were returned to duty and 38 were found unfit for military service. A large proportion of the invalids manifested mental symptoms.

It might not be easy, Colonel Kennedy continued, to differentiate hysteria from malingering, or from organic nervous disease; still more difficult was it to decide whether one was dealing with a reflex nervous disorder, such as might be associated with a wound. Hysteria might be superimposed upon an organic lesion, or upon a toxic condition. In the "Nomenclature of Diseases" of the Royal College of Physicians, which the Army adopted, no name was provided intermediate between neurasthenia and psychasthenia; hence it was difficult to place such psychoneuroses as anxiety, compulsion, and obsessional neuroses. Some of the cases diagnosed as hysteria and included in group (*d*) could be more accurately described as anxiety neuroses. As to the disposal of cases of hysteria, he thought the decision whether a hysterical patient should be retained in the Service or not depended on a collective consideration of the length of service, the evidence of previous history, and the effect of treatment. In cases in which hysterical symptoms developed soon after enlistment and there was a definite previous history of nervous disability, the patient could be of but little use in the Service. The treatment, apart from general considerations of health and the application of electrotherapy, took the form of counter-suggestion or persuasion. A patient who was not easily amenable to persuasion might require a prolonged course of treatment and ceased to be an economical proposition for the Army in peace time. Still, the principle that no man should be discharged from the Service uncured of a curable disability was one which he would like to see carried out. The question of specialist psychotherapeutic treatment was receiving attention. The situation was different in war time, when the whole of the resources of the country were devoted to the maintenance of man-power. The problem remained, in essence, one of eugenics and upbringing.

Rear-Admiral E. T. **MEAGHER** said he was excluding from his discussion occupational neuroses, such as writer's cramp, chorea which might arise as a result of psychic shock, and exophthalmic goitre. People fell into three groups—normal, psychopathic, and neuropathic. Some held that there was a germinal defect, and that the majority of people who subsequently developed mental defect or disorder had this deficiency. A terrifying shock might have a more or less permanent effect on the mind of a child, but unless neuropathic or psychopathic, such a person was not likely to develop a psychoneurosis. He did not know any way of determining whether such inherent weakness existed in a particular individual. He thought a new entrant to the Service should be under observation in the first months to see whether he manifested any characteristics indicating nervous instability. It was agreed that, apart from hereditary predisposition, a normal person if subjected to exceptional stress might break down. Conditions in the Navy tended to raise the resistance to hysteria. Hysterical manifestations could often be traced to some psychic shock. In the Navy the hysterical fit was common, and for these cases a word or two of advice and discharge to duty was the best course to adopt. Hysteria was manifested most in the less educated; indeed, he had not seen a case of pure hysteria in an officer. It was easily provoked in those of neuropathic constitution.

In regard to diagnosis, the chief thing was to make sure that organic disease did not coexist. According to Kraepelin, 50 per cent. of cases of manic-depressive insanity showed hysteria. In treatment the medical officer should adopt measures to check loss of emotional control by advice or by isolating the patient. Galvanism would cure aphonia, and the hysterical fit could be cut short by physical measures. The doctor must gain domination over the patient. It had been found that the "Old Contemptibles" were not liable to displays of functional nervous disorder. The Navy did not show much change in the incidence of functional nervous disease as compared with the years before the late war. In conclusion, the speaker advocated uniformity of nomenclature and terminology for all the Services and for general use.

Squadron-Leader M. L. **BURTON** said the problems in the Royal Air Force differed somewhat from those in the Army and the Navy, for in peace time the stresses in flying were more pronounced than in those other branches. Even the more stable type of man might break down if the stress was exceptional. The highest figures for the incidence of functional nerve disease in the Air Force were in 1922–23; since then there had been a steady decrease. The incidence was highest among those actually flying; those who through age or other cause did not fly regularly came off best. In neurasthenia the predominant symptom was mental or physical fatigue, with pains, headaches, digestive disturbance, with general depression and lack of energy. In the anxiety neurosis the symptoms were mainly psychic, and the picture was one of nervousness, the patient had a sense of foreboding, worried over trifles, and was easily disturbed. Psychasthenia was characterised by a defective power of volition; the patient was unable to make and act on decisions; doubting mania also occurred, and claustrophobia. Only a small number of flying officers broke down, even when subjected to exceptional stress. Psychoneurosis developed because the subject could not adapt himself to his environmental condition. Some cases of functional nervous disorder occurred after mild head injury, which might have been so slight that concussion was not suspected. When a toxic factor had been operative the case would usually respond to appropriate treatment.

Dr. **ALDREN TURNER** spoke of what had been found in officers at the War Office Medical Board. These cases were usually of a special character. Hysteria, as illustrated by the usual stigmata of paralysis, fits, and anæsthesia, was rare. In young officers there had been cases of fits developing under special circumstances of mental strain and over-work, and perhaps to some extent aggravated by personal habits and climatic conditions, as in India, and in these cases the fits usually ceased on the return of the patient to this country. The outstanding functional nervous disorder observed among officers was neurasthenia, using that term in its widest application. For the purposes of description he had made three groups: (1) the more purely debilitated or nervously exhausted cases; (2) those showing evidence of anxiety, accompanied by characteristic physical signs; (3) those with the post-concussional syndrome. In the group characterised by anxiety, causes of a psychological kind played an important part, including distaste for certain duties and disciplines. Thyroid enlargement in these cases was practically unknown, but there was reason to believe there was a disturbance of endocrine function and of the vegetative nervous system. Those who suffered a breakdown during the war were thereby rendered liable to a relapse if strain and stress were renewed.

BRITISH PSYCHOLOGICAL SOCIETY.

The Psychiatric Section of this Society held a joint meeting with the Psychiatry Section of the Royal Society of Medicine on April 9th. The chair was taken by Dr. **EDWARD GLOVER**, President of the former section. A discussion on

THE PSYCHOPATHOLOGY OF ANXIETY

was opened by Dr. **ERNEST JONES**. He said that the term "morbid anxiety" distinguished a collection of phenomena from those grouped under the name of "fear." Two features justifying this distinction were disproportion between the stimulus and the response, and disharmony between bodily and mental manifestations. In pronounced cases, such as claustrophobia in a closed room, these were very marked, but in borderline instances it was difficult to assess "normal" distress. Psycho-analysts had learned to set a very high standard of "normal" bravery, and to maintain that much timidity passing as normal was really neurotic and curable. The anxiety nature of the physical manifestations was often overlooked clinically. Symptoms such as chronic diarrhœa, psychical impotence, sweating, and flatulent dyspepsia were often wrongly interpreted. Bodily manifestations were much more striking in morbid anxiety than in normal fear, and suggested a thwarted instinct. Another well-recognised feature was the internal disharmony among the manifestations themselves. The physical groups did not seem to be constituted for any biological purpose. Mentally there was neither activity nor passivity, but a curious mixture of over-excitation with paralysis. Physically the dissociation might go so far as to produce a mainly monosymptomatic picture. These features strongly suggested a disorder rather than a simple exaggeration of the fear instinct.

The Freudian View of Anxiety.

Freud had, primarily on a physical basis, separated morbid anxiety from the "neurasthenia" group of Hecker and had regarded it as due to undue sexual excitation with deficient opportunity for discharge. The anxiety was found in place of frustrated libido, and the physiological basis was generated from the physiological basis of libido by some unknown process of chemical transformation. Phobias presented the same picture of anxiety appearing as substitute for a thwarted libidinal impulse. Morbid anxiety was a perverted manifestation of the fear instinct which, in neurotic conflicts, had been stimulated to activity as a protection against the threatening libido. It was the ego's fear of the unconscious. Real dread (i.e., fear of real danger) concerned the ego only and had nothing to do with the desires of repressed libido; it was a normal protective mechanism. Nevertheless real dread contained one useless element which closely resembled morbid anxiety. On the affective side there was a state of anxious preparedness and watchfulness, a useful state but useless when—as often—it passed over into terror, which paralysed both body and mind. Even in situations of real danger a state of developed dread was not part of the useful biological mechanism of defence, but an abnormal response akin to the neurotic symptom. Freud had suggested that this developed dread was derived from the narcissistic libido attached to the ego. The anxiety of war shock and probably also that of hypochondria developed in four stages: (1) perception of external danger; (2) normal fear-response of mental alertness and physical preparedness; (3) over-investment of the ego with narcissistic libido as a protective response; and (4) evocation of morbid anxiety on the part of the ego to the excess of narcissistic libido. The last stage was useless and indeed detrimental as far as the external danger was concerned. Obviously uncontrolled libido could be a danger to the ego; there were manifest social risks and unconscious infantile fears were at work. In face of the infantile situation the child had been helpless, alarmed, and at the end of its resources, and its erotic wishes had been impossible to gratify. To the infant strong excitation without relief was tantamount to losing the very capacity for obtaining relief; the most familiar clinical manifestation of this state was the castration complex. The first step in the child's attempt to cope with this state of affairs was the group of reactions later to be called morbid anxiety. The apparent lack of purpose and coördination reminded the observer of the earliest reactions of the infant to distress, and they performed certain functions. Some of them, notably the over-activity of excretory organs, furnished a limited gratification and relieved tension. Others—for example, the respiratory manifestations—called attention to the urgent need for help. In more extreme states a protective paralysis occurred, and the last resort of the child, as of the neurotic, was an artificial inhibition of vital activity, including the disturbing impulses. Freud—and before him Erasmus Darwin—had suggested that many characteristic features of anxiety were copied or even derived from the event of birth. Only careful correlation of the phenomena of birth and of morbid anxiety with the various manifestations of the fear instinct in animals would give final light on the puzzling problem of the relation between external and internal danger, of the conflict between the interests of the individual organism, and the threat provided by the activity of racial impulses.

Anxiety in the Psychoses.

Dr. HENRY YELLOWLEES suggested that Freud meant a totally different thing by "anxiety" from the meaning applied to the term by psychiatrists. Text-books of psychiatry allowed no place to anxiety among the psychoses save in involutional melancholia, in which it almost invariably played a part. Craig and Beaton called agitated melancholia the "associated psychosis" of anxiety. Clinical observation showed that the true psychoses had little or nothing to do with Freud's anxiety state. Freud had described generally increased nervous instability, whereas the true psychotic was remarkably indifferent to stimuli like noise. The anxious patient imagined the worst in any given set of circumstances, and exaggerated possibilities, but no extension of this mechanism would ever produce the delusions of the melancholic, who ignored possibilities. The melancholic, if he could escape for a moment from his delusions, dealt efficiently with real emergencies; the speaker had known a melancholic doctor, who spent his time banging his head against the wall, turn and deal effectively and professionally with a fellow-patient who had an epileptic fit. There was no better aid to differential diagnosis than an air-raid. Freud had spoken of vertigo, digestive disturbances, particularly ravenous hunger, paræsthesia, and phobias as characteristic of the anxiety state; these were not features of melancholia.

Discussion.

Dr. BERNARD HART said that the theory of transference of libido into anxiety was quite intelligible chemically but not as part of a psychological and biological concept. He agreed with Dr. Jones that fear was an integral part of the reaction to danger and that anxiety and dread were identical in their essential mechanism—in both the ego was failing to master the situation—with the one important difference that anxiety was the response to internal stress and real fear or dread to external danger. The essence of the reaction was not so much the protection of the ego as the failure to protect it adequately. Dr. Rickman had spoken in this connexion of the "helpless ego." If the response to external danger were completely reactive there was no fear, and if the response to internal stress were completely reactive there was no anxiety. If dread was not a part of the normal reaction to danger some other factor was required to account for it, but whatever this factor might be it must afflict a very large proportion of the human race, for dread was extremely common. "Ideal" or "fully adaptive" would be a better phrase than "normal." Other exciting causes than narcissistic libido would fit in with the failure of the ego to master danger. In war-neurosis there was anxiety as long as the struggle to keep unpleasant memories out of consciousness was only partially successful; anxiety disappeared when a fairly adequate pathological adaptation–amnesia, existed or when the situation was altered by treatment and the relation of the ego and the partial memories was adjusted. The full picture of anxiety neurosis did not appear in true psychoses because the clinical picture was modified by the peculiarities of the psychosis, but the chief characteristics of morbid anxiety, if defined as apprehension, tension, and unrest, were clearly discernible in psychoses, especially in involutional melancholia and alcoholic psychosis. The other factors mentioned by Dr. Yellowlees were secondary and derivative. Ravenous hunger was certainly not typical of anxiety.

Dr. R. D. GILLESPIE said that certain well-known states of mental unpleasure arose from conflict, but he doubted whether repression or morbid sexual history were essential factors. One form of anxiety was associated with cardiac lesions. It was obviously protective, but there was some evidence that frustrated instincts might produce a number of states, not anxiety alone. He questioned whether the new-born child showed signs of anxiety, though of course it might have shown them before the final "knock-out" of birth. Obstruction of breathing in a young baby produced signs not of anxiety, but of anger. Shakespeare had anticipated both Erasmus Darwin and Freud, when he ascribed the fearlessness of Macduff to the fact that he had been born by Cæsarean section.

Dr. J. A. **Hadfield** said that there were difficulties in the way of ascribing anxiety states to physiological disorders. Patients might suffer and die from severe toxic conditions without manifesting anxiety; others might appear in normal health and vigour and yet have terrible dreads. Although toxic foci might be found in most cases of anxiety it was likely that they would also be found, if sought, in most normal people. A morbid fear might come on in a 'bus and not in a tube or taxi; were we therefore to believe that the toxic condition became active only in Regent-street and not in Leicester-square? Anxiety might often be dispelled by suggestion, but it was hard to see how the toxicity was cured in this way. There was an intimate connexion between adrenalin and anxiety, but to prove this relationship causal it must be shown that injection of adrenalin produced anxiety. He agreed with Dr. Jones that emphasis should be laid on the psychological factor; that anxiety was abnormal under any circumstances, and that it was not a transformation of libido into fear, but he differed in regarding anxiety as due to fear in the ordinary sense and not only to threats to the libido. It often might be due to threats to the sexual libido, as in nightmares, but conflict between egoistic aggressiveness and fear of obliteration was a common cause. Some marked cause of fear in infantile life very constantly turned up in analysis, and might be regarded as a factor predisposing to the attack of fear. Anxiety states were infantile reactions and fear was one of the most constant experiences of childhood. The infant reacted by fear to noise and to the withdrawal of support, and the older child reacted to fear by egoism and amenableness. Any threat to these precipitated anxiety in later life.

Sir **Maurice Craig** pointed out that no disorder consisted of one symptom and that anxiety appeared in many conditions. From the therapeutic standpoint he wanted to know why these factors became effective. Pavlov's work held out a hope that something might be done to prevent their operation.

Dr. W. H. **Stoddart** said that for a long time he had been unable to differentiate between involutional melancholia and the melancholia of manic-depressive insanity because anxiety occurred in both. He had found anxiety states also in paranoia, but did not agree that they were characteristic of all neurosis; some obsessional cases might show no anxiety. He believed the value of potassium bromide to lie in its anaphrodisiac properties.

Dr. **William Brown** pointed out that one-seventh of all men invalided from the army were victims of neurasthenia, despite the fact that 70 per cent. of those who came to special shell-shock centres were fit to be sent back into the line after treatment. He therefore agreed with Dr. Hart in requiring explicit evidence of narcissism as the cause of the neurosis, which must be very common. Fear was the result of failure of adaptation and was distinct from the instinct of self-preservation. He protested against the use of the term "libido" as if it were something that could be repressed and had its own energy.

Dr. L. S. **Kubie** asked whether an anxiety situation would always lead to an anxiety state. The hysteric might have no emotional content, although the origin of his condition lay in a difficult emotional situation often tinged with anxiety. The absence of anxiety from the picture of psychotics still left the problem of what part anxiety might have played in the production of their symptomatology.

Dr. T. A. Ross described a case in which anxiety was manifested without any lack of direct sexual expression. The psycho-analyst might claim that this expression had been absent in early childhood, but the childhood of the patient had offered several far more obvious causes of fear; he had lived in fear of hell inculcated by a religious father and of destitution because his parents were in the habit of leaving him alone in the evenings. Sex differences were to be found everywhere, but these other difficulties were extremely important. The whole life of many children was one of discomfort and fear.

Dr. **Jones**, in reply, agreed that by "normal" he meant "ideal" or "completely adapted," which was very rare indeed. The total figure for shell-shock in the army only worked out at about 2 per cent., which was the figure also given for homosexuality among the general population. He agreed that anxiety might be due to conflict in respect of hatred or aggressiveness, but held that the vast bulk of those emotions were evoked as a result of thwarted libidinal impulses. Why was a patient afraid of his libido? Obviously because of what it might lead to, and murder was one of the most likely things.

Dr. **Yellowlees** also replied.

EDINBURGH OBSTETRICAL SOCIETY.

At a meeting of this Society on March 15th, with Dr. **Haig Ferguson**, the President, in the chair, a paper on

A Scheme of Maternity Service

coördinating antenatal, domiciliary, and hospital treatment was read by Dr. **James Young**. It was now generally agreed, he said, that the high maternal mortality and morbidity rates were dependent primarily on the inadequacy of the machinery of present-day midwifery. The present service by medical men was wasteful of lives and health because the duties of general practice were incompatible with satisfactory midwifery. The annual death-rate amongst mothers in England and Wales was about 5 per 1000 live births. This implied the death of about 3000 women every year and, on a moderate estimate, at least 30,000 more women annually suffered more or less lasting damage from childbearing and childbirth. The best results were found where the service was carried out by midwives with doctors available for the emergencies. The proved advantages of such a combine were seen in the practice of the Queen Victoria Jubilee Institute for Nurses of England and Wales and in the outdoor practice of the large maternity hospitals, where the death-rate was very low. An ideal practice in these respects was the East End Maternity Hospital in London, where for many years the death-rate in a total of about 2000 unselected cases treated annually was under 1 in 1000—that is, about one-fifth of that obtaining over the rest of the community. On analysis the reason for the low death-rate in these hospital practices was found in the fact that they were carried out by self-contained units, each serving its own district, in which the normal cases were conducted physiologically by midwives and in which the antenatal supervision and the management of the abnormal cases were carried out by the doctors belonging to the service. In this way there was a continuity of supervision and control of the antenatal, the domiciliary, and the hospital treatment of the patients and of the personnel responsible for the services. The system made for a physiological management of the 90 per cent. or thereabouts of normal cases and for early discovery and efficient treatment of abnormalities.

Dr. Young believed that an adequate maternity service was possible only if planned on a national basis, having as its object a coördination of the activities of the midwife, the doctor, the National Health Insurance, and the local authorities, which at present were unrelated and often overlapped. This service should work in conjunction with voluntary agencies, such as hospitals, and should include: (1) a midwife for every labouring woman; (2) antenatal supervision of every case; (3) a service by doctors for complications; and (4) the hospital. Pending establishment of a national service much might be done if local authorities undertook to make provision for their own needs. It was important to relieve doctors in busy general practice of the duties of midwifery, and the doctor personnel or the service should consist largely of general practitioners selected because of their special experience and training and of a comparatively small number of specialists. Dr. Young believed that in every area the "unit" system should be aimed at as far as possible for, by ensuring continuity of treatment and responsibility, it would lead reciprocally on the one hand to an elevation in the standard of domiciliary practice and on the other to a prevention of the tragedies of the present-day maternity hospitals. The fact that all cases were under the control of the unit from the beginning meant that there was no vitiation of the hospital environment by the introduction of women with passages infected before admission by the injudicious management of some outside attendant over whose methods the hospital had no control. In this way the atmosphere of the hospital was kept secure for clean midwifery. In the East End Maternity Hospital in London, whose practice was based on this sytem, sepsis had been practically eliminated for many years. On the other hand, infection of the normal case was one of the outstanding disadvantages of the present-day maternity hospitals, which opened their doors to clean and unclean alike. The recent report of the Scottish Board of Health on maternal mortality referred to the high death-rate in maternity institutions in Aberdeen due to this contagion and other writers (for example, Dame Janet Campbell) had referred to the same thing. In the Edinburgh Royal Maternity Hospital there had been 72 cases of puerperal sepsis with five deaths amongst normal spontaneous deliveries in four years. Dr. Young spoke of the complexity of the segregation problems which faced every such mixed hospital and raised the question whether, under the present unsatisfactory conditions of maternity practice, it might not be desirable to abolish the large mixed hospital and, in such districts, to have two kinds of hospital, the one for "booked" and clean cases—that is, those under the supervision of the hospital—and the other for the infected or suspect cases. He believed that the "suspect" case (for example, the unsuccessful forceps case, the case of placenta prævia plugged before admission, and the abortion) raised even greater segregation difficulties than the frankly septic case and that the tragedies of the hospital sprang chiefly from it.

Dr. E. **FARQUHAR MURRAY** (Newcastle) read a complementary paper on

The Future of Obstetrics,

with Special Reference to the Development of a Maternity Service. The main criticism of the present system, he said, was that essential services were not available for many patients of the industrial classes, and he indexed the essential requirements as: (1) Antenatal supervision. (2) Clean surroundings during the confinement which takes place under the supervision of a midwife. Also an abundance of surgical dressings and lotions. (3) A doctor who is on call to assist delivery, to repair lacerations, and to deal with complications. (4) Good nursing. (5) Postnatal supervision. (6) A consultant service. It was absolutely essential that the nursing should be good, and this would never be obtained so long as "handywomen" were tolerated. A maternity nursing service should be organised under direct medical supervision and control, and trained nursing should be placed at the disposal of a doctor whose patient was unable to make provision for it. Such a nursing service under the supervision of a sister midwife would ensure that accurate temperature charts were kept, and the onset of inflammatory processes would be recognised early. The nurse would report the presence of fever to the sister midwife who would at once inform the doctor. The present system of allowing the midwife full charge was fundamentally wrong, and would never be righted until there was properly organised medical supervision of this nursing. Dressings should be available for even the poorest patients, and such dressings would consist of an accouchement sheet, wool, binder, diapers, and towels. The dressings would be sterilised and the nurse would be responsible for those which should be returned. Antenatal centres should be established and should be available for all doctors engaged in industrial practices. The antenatal centre should be staffed by the general practitioner who resided in the area and not by whole-time officers or specialists.

The organised maternity service should work somewhat as follows. Each woman would select a doctor and would enter her name at the nursing centre. The doctor would carry out the antenatal examinations. Nursing service would be responsible for the routine urine examination and health visits. The doctor would be called to the confinement if required by the midwife, and certain routine visits would be paid during the puerperium. Consultant services should be available for any cases of difficult labour with which the practitioner could not deal. An emergency service should also be organised which would provide at short notice a nurse, blankets, hot water-bottles, transfusion apparatus, and, if necessary, a specialist. By this means, instead of transferring a shocked and collapsed patient to hospital the specialist and nurse would be rushed to the patient. The cost of this scheme could be met without making any demands on the State or the approved societies as the maternity benefit could be used for its administration.

ERRATUM.—Mr. N. Howard Mummery writes: "May I correct certain errors in the report of my paper recently read at the Royal Society of Medicine's Dermatological Meeting and reported in your issue of March 30th. I stated that the chief aim of an industrial medical officer was to prevent the occurrence of dermatoses. I did not state, as I am reported as saying, that, in the main, private or panel medical practitioners, or factory surgeons, had an inadequate knowledge of dermatoses. I said that they had an inadequate knowledge of the conditions of employment and of the home conditions of industrial workers. Further, I am made to say that I rejected for employment persons 'showing marks of seborrhœic states'; this phrase should read 'showing marked seborrhœic skin states.'"

BRITISH ORTHOPÆDIC ASSOCIATION.—The Robert Jones Medal and Association Prize for 1928 has been awarded to Mr. E. P. Brockman for his essay on Club Foot (Congenital Talipes Equinovarus).

BRITISH EMPIRE CANCER CAMPAIGN.—The quarterly meeting of the Grand Council of this Campaign was held on April 8th, with Lord Reading in the chair. The following grants to London institutions were made: £3500 to the Cancer Research Department of the Middlesex Hospital, £650 for research at St. Mark's Hospital, £80 for research by Dr. J. C. Mottram at the Radium Institute, and a sum of £500 for special investigations to be made at the Cancer Hospital under a scheme submitted by Dr. E. L. Kennaway.

The newly formed Cancer Research Centre in the North of Ireland was invited to become an affiliated body of the Campaign. The Council extended its congratulations to the recently organised New Zealand Branch of the Campaign, which was inaugurated during a visit to Wellington by Mr. Sampson Handley.

The summary of the recommendations made by the Committee of the International Conference on Cancer held in London last July, was submitted to the Council, which passed on the recommendations to the Investigation Committee of the Campaign. Inter alia the Committee strongly urges that the British Empire Cancer Campaign, in collaboration with the Medical Research Council and the Ministry of Health, should invite all institutions using radium and X rays to utilise an agreed form of record.

Reviews and Notices of Books.

COLOUR AND COLOUR THEORIES.

By CHRISTINE LADD-FRANKLIN. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1929. Pp. 287. 12*s*. 6*d*.

THERE are three main theories of colour sensation. The first is the Young-Helmholtz theory, the basis of which is physical, founded on the proved fact that all the colours of nature can be imitated by three selected spectral colours in appropriate proportions. The second is that of Hering, the basis of which is chemical. It postulates a retinal mechanism which permits the alternate composition and decomposition of three different chemical substances by the action of light, giving rise to six different colour sensations, among which are included black and white. The third, that of Edridge-Green, is evolutionary, and shifts the mechanism for the distinguishing of colours from the retina to the brain, those individuals who are more highly developed in this respect being capable of distinguishing a greater number of colours than those who are less developed. Dr. Christine Ladd-Franklin, who is a psychologist, declares her main objection to the Young-Helmholtz theory to be that though the sensation white may be produced by a mixture of red, green, and blue lights, white is nevertheless not a red-green-blue sensation. We are asked to believe, she says, that when we experience the sensation of a faint colourless light we are really sensing red and green and blue without knowing it, and this idea, she says, is so bizarre that it would seem as if to mention it were enough to show its inadequacy. Dr. Ladd-Franklin's own theory, being a chemical one, approaches more nearly to that of Hering, but, she says, the fact that red and green must be regarded as a colour pair which, when combined, result in white, is fatal to Hering's theory; the combination actually produces yellow. Her own theory she terms the "molecular dissociation theory." The retinal basis of the light sense is a photochemical process, and the eye which furnishes the colour sense contains more complicated chemical substances than do the retinæ, which are defective. She supposes a chemical substance which under the influence of light undergoes dissociation, but whereas in the rods (which do not convey any colour sensation) this dissociation is at once complete, in the cones the process is more complicated and takes place in successive stages. In a primitive evolutionary condition, and also in the totally colour-blind individual, the cone process is absent—i.e., there is no partial dissociation and no colour sensation. In a more advanced condition the partial dissociation of the colour molecule gives rise to the colour sensations yellow and blue, a state of things which exists not only in the partially colour-blind, but also in the more peripheral parts of the retina where the cones are sparse, and also in twilight. A further dissociation of the molecules which give rise to the yellow sensation, or some of them, occurs in the normal individual, giving rise to two new sorts of molecules which excite the sensations red and green respectively.

The theory is both chemical and evolutionary, and in the latter respect has something in common with that of Edridge-Green, but whereas the latter regards the evolutionary process as cerebral, Dr. Ladd-Franklin looks for it in the chemistry of the retina. It is remarkable that although there is a detailed discussion in this book of the two older theories, that of Edridge-Green is entirely ignored. Certainly in one respect Dr. Ladd-Franklin's theory has the advantage, in that it is not inconsistent with monocular colour blindness, a condition which, though very rare, has occasionally been discovered. It is a pity that this book is not more systematically written. It consists in fact of reprints of a number of essays which have appeared in various periodicals from 1892 to 1927, so that there is a great deal of repetition without much logical sequence. At any rate, however, it provides material which cannot be ignored.

NEUROSURGERY.

Principles, Diagnosis and Treatment. By WILLIAM SHARPE, M.D., Professor of Neurosurgery, New York Polyclinic Hospital and Post-Graduate Medical School; and NORMAN SHARPE, M.D., Attending Neuro-surgeon, St. Mark's Hospital, New York. London: J. B. Lippincott Company. 1928. Pp. 762. £2 2*s*.

FEW comprehensive works on neurological surgery have appeared in recent years, though during that time the specialty has been one of the most active branches of surgery. The appearance of this rather expensive volume will therefore be hailed with interest; but the reader who hopes to find an accurate and orderly description of the more recent developments of neurological surgery will suffer disappointment. The book is an account of the authors' personal experience and consists for the most part of *ex cathedra* and oft-repeated statements of their somewhat heterodox views. Thus, undeterred by the experiences of the Great War, the authors advocate early laminectomy ("after the patient has rallied from the initial shock of the injury") for spinal injuries producing compression of the spinal cord. They also favour laminectomy in certain types of multiple sclerosis. For gliomas of the brain they prefer simple decompression to removal of the tumour and they are very pessimistic as to the outlook in these cases, though it has for some time been known that many gliomas possess a very low degree of malignancy and operation in these may be followed by freedom from symptoms for a number of years.

The first part of the book is devoted to surgical conditions of the brain. After a comparatively short chapter on tumours, brain abscess is discussed in an interesting way. The authors put forward a view which is unusual, but perhaps not unreasonable, when they urge that subtemporal decompression should be performed in most cases of temporo-sphenoidal abscess and that exploration of the brain for the abscess should take place through the subtemporal incision and not through the infected field of the mastoid operation. In the chapter on head injuries a short account is given of personal work on injuries at birth. The authors found from lumbar puncture in a series of some 500 newly born infants that intracranial hæmorrhage of varying degree occurred in 9 per cent. of the cases, particularly in first-born full-term males. They suggest that in these cases the early institution of repeated lumbar punctures will prevent the onset of cerebral spastic paralysis. Hydrocephalus, cranial deformities, the methods of neurological investigation and of cranial operations are discussed in turn. In subsequent sections, the surgery of the spinal cord, cranial nerves, and peripheral nerves is considered. There is also a chapter on the surgical treatment of early selected cases of purulent meningitis, in which the main point taken up by the authors is that in cases of localised purulent meningitis, associated with disease of the mastoid process, subtemporal decompression should be performed on the corresponding side of the head.

It will be readily gathered that the authors hold original ideas about neurological treatment and their book certainly stimulates the reader to reconsider the basis of many existing beliefs. They would have strengthened their work greatly if they had paid more attention to the orthodox views of the period and had introduced their points of controversy with detailed case reports and complete statistical information of their personal experience. Such cases as have been reported for the most part do not support the authors' arguments, or are so lacking in essential details that they arouse in the reader the suspicion that the book has been too hurriedly prepared.

X RAY EXAMINATION OF THE HEART.

Radiologia Clinica del Cuore e dei Grossi Vasi. By CESARE PEZZI, Professor of Medical Pathology, University of Milan. Milan: Cooperativa Farmaceuta. 1928. Pp. 331. Lire 40.

THE technique of X ray examination of the heart and great vessels has been greatly developed and perfected during recent years, and at the present time the X ray method must be considered as valuable as the electrocardiograph, if not more so, in the investigation of cardiovascular disease. Not only can the actual size of the heart be determined from the teleradiogram or orthodiagram, but valuable information is also obtained from a study of the contour of the heart and aorta viewed from different angles, and of the character of the pulsation.

Prof. Pezzi, in a monograph dedicated appropriately to Vaquez and Bordet, has given us a comprehensive account of the application of X rays to the study of the heart. He prefers orthodiagraphy to teleradiography as the most serviceable method of recording the exact size and shape of the organ, and he advocates the rather complicated system of measuring the orthodiagram elaborated by Vaquez and Bordet. After describing the technique employed, and the normal appearance and dimensions of the heart shadow, he discusses the modifications seen in disease, valvular lesions, heart failure, pericardial effusion and adhesions, hypertension, angina, and less common affections all being considered in detail. Three chapters are devoted to the aorta in health and disease, and here the illustrative radiograms are particularly good. On the subject of congenital malformations and of affections of the pulmonary artery Prof. Pezzi is a recognised authority, and the X ray appearances in these conditions are fully described. Expansile pulsation of the pulmonary arteries in the lung roots—the so-called hilum dance—is regarded as diagnostic of pulmonary incompetence. The text is profusely illustrated throughout by anatomical figures, orthodiagrams, and radiograms, and an adequate bibliography is given at the end of the book.

The treatise is likely to become a standard work on the increasingly important subject of the X ray examination of the heart.

THE SETTING OF FRACTURES UNDER THE FLUOROSCOPE.

La réduction des fractures sous écran radioscopique. By Dr. RADUTZESCO, formerly a Foreign Assistant in the Surgical Therapeutic Clinic of the Faculty of Paris of Dr. Pierre Duval; Surgeon to the Hospital "Regina Elisabeta" in Bucharest. Preface by M. PIERRE DUVAL. With 125 figures in the text and on 48 plates. Paris: Masson et Cie. 1928. Pp. 196. Fr.50.

Dr. Radutzesco in this small monograph describes and advocates a method of setting fractures, especially those of the lower end of the forearm and of the leg, with the help of the X rays and fluoroscopic screen. He sets forth the advantages of this method both in the reduction of the displaced bones in their fixation in plaster, and subsequently in examinations carried out to make sure that the correction and fixation remain satisfactory. He warns his readers against the dangers of frequent exposure to the rays and gives details of the precautions necessary to minimise the quantity of exposure. The special form of fluorescent screen used consists simply of an oblong screen, the "pelle radioscopique du Dr. Henri Béclère," measuring 13 × 18 cm., to which is attached a long handle set in a plane parallel to but above that of the fluorescent surface. Its obvious resemblance to a spade has suggested its name. The fluorescent material is covered by a piece of lead glass 10 mm. thick. Full details and a series of radiographs are given of seven cases of fracture near the wrist, one of the shaft of the humerus, and four of the ankle. Inhalation anæsthesia is recommended for the setting of fractures of the upper extremity and spinal anæsthesia for the lower. The results, immediate and remote, appear to have been excellent. Dr. Radutzesco points out that there are pitfalls awaiting the unwary in the application of this method, and he tells readers how to avoid them. The same methods might no doubt be used in fractures of other parts of the limbs, but less easily and less completely than in those of the wrist and ankle. They seem to us to be too elaborate to be practicable in the rush and hurry of a general hospital. In private work a surgeon with the necessary time, experience, and apparatus at his disposal may hope to secure excellent results with fracture treatment in this way.

GROWTH.

By W. J. ROBBINS, S. BRODY, A. G. HOGAN, C. M. JACKSON, and C. W. GREENE. New Haven: Yale University Press. 1928. Pp. 189. With 83 figures. 14s.

THESE five semi-popular lectures by members of the staff of the University of Missouri deal with the nature of growth, its statistical, nutritional, and morphological aspects, and the influence of the ductless glands. The most interesting perhaps is Prof. Brody's summary analysis of the course of growth and senescence, which deals with facts that ought to be familiar to anyone concerned with nutrition. Though when he gets away from facts, and says—e.g., "Why does growth occur? Because there is an inherent tendency which causes cells to divide," we could wish he had put a footnote "this is a joke" or "this is not a joke," as the case may be. The other four chapters are all good, and we can heartily recommend the book as an introduction to a great subject.

THE DIFFERENTIAL DIAGNOSIS OF BLOOD DISEASES.

Praktische Differentialdiagnostick. Teil 8. Blutkrankheiten. By Dr. ALBERT HERZ, Lecturer at Vienna University. Dresden: Theodor Steinkopff. Pp. 86. M.8.

THIS slender volume, containing less than a hundred pages, is a surprisingly complete synopsis of modern knowledge of blood diseases. It contains little that is new, but omits little that is important. The arrangement is logical, and reference is easy; but illustrations are scanty and poor, and technical details are inadequate and scattered through the text. It is, however, a satisfactory work for the purpose for which it was written, and many clinicians will probably find that this reasonably priced book will give an answer to the everyday problems of differential blood counts.

BACTERIOLOGY.

Morphologic Variation and the Rate of Growth of Bacteria. By A. T. HENRICI, Professor of Bacteriology in the University of Minnesota. London: Baillière, Tindall and Cox. 1928. Pp. 194. With 36 figures. 13s. 6d.

THE early ideas about the abundant pleomorphism of bacteria were completely upset by the discovery of adequate methods of making pure cultures. In the rebound there has been a long period in which bacteria have been thought to be much more uniform in size and shape than they really are. Prof. Henrici has been looking again at the forms of several species and measuring them at different stages of growth under various conditions, and he has made out that they change in accordance with plans which can be approximately ascertained. Some, at any rate, of the pleomorphism which has lately been supposed to represent life-cycles can be explained along these simpler lines; though the author does not deny the possibility of complicated modes of reproduction, he merely says they are not proven.

LE CANCER PRIMITIF DU POUMON.

Étude anatomo-clinique. By RENÉ HUGUENIN, Ancien Interne Lauréat des Hôpitaux de Paris; Préparateur du Laboratoire d'Anatomie Pathologique de la Faculté. Paris: Masson et Cie. 1928. Pp. 330. Fr.50.

THIS monograph appears at an opportune time. Lung tumours have been prominently under the notice of clinicians and pathologists during the last ten years, and although much has been written on the subject the information is scattered. A comprehensive and complete study such as Dr. Huguenin has made is therefore of particular value. The work has involved deep research into the literature as well as an intimate study of many cases which have come under the personal notice of the author. All aspects are treated exhaustively. Our ideas of the pathology of cancer of the lung at the present time are undergoing some revision, especially in regard to the nature and origin of the oat-cell tumours, and Dr. Huguenin shows a critical appreciation of the problems at issue. The question of ætiology, too, he approaches with caution. In the clinical section, and especially in that part concerned with diagnosis, some original observations have emerged from personal experience of the author and his colleagues. A large section of the book is concerned with descriptive notes of 46 cases of chest tumour. The histological drawings and skiagrams illustrating lung cancers are excellent. The monograph will doubtless take its place as a standard work on tumours of the lung and mediastinum.

WHITHER MANKIND.

A Panorama of Modern Civilisation. By 18 contributors. Edited by C. A. BEARD. London: Longmans, Green and Co., Ltd. 1928. Pp. 408. 12*s*. 6*d*.

THIS book is based on "the assumption that science and the machine are two invincible facts with which all must reckon. Those who refuse to face them are condemned in advance to sterility and defeat." It consists of 18 essays under the titles, Science, Business, Labour, Health, Religion, the Family, Play, and so forth, in which the respective authors speculate on where we are and where we shall be. It is, in short, yet another symposium on the spirits of the age and, as generally happens, the authors immensely overrate the importance of their catchwords and forget the spirit of the ages, of which any philosophical biologist could have told them; curiously enough there is no such collaborator in the list.

FROM THE SEEN TO THE UNSEEN.

By JOHN H. BEST, B.Sc. Lond., Vicar of Little Marlow, Bucks. London: Messrs. Longmans, Green and Co., Ltd. 1929. Pp. 552. 18*s*.

THIS is an attempt, well documented and supported by much scientific and philosophic knowledge, to prove that there is an existing God, Who, in the words of the Prayer Book, is the "Maker of heaven and earth, and of all things visible and invisible." Such being the proposition, its demonstration is proceeded with in an orderly manner. A preliminary section having discussed the chief characteristics of life, animal and vegetable, and the relations existing between plants and animals having been demonstrated, the doctrine of evolution is found not to militate against any of the arguments that can be adduced for belief in a Divine design. The following two sections deal with physiology and embryology on recognised lines, the summaries which close the sections being clear and instructive, and proving the author to have followed carefully the lessons of much reading and to have real skill in presenting those lessons briefly. Up to this point the author has been attempting to show, especially in the passages closing each section, that every attempt to arrive at the sufficient cause of embryonic development along purely mechanistic lines is doomed to failure. Now, in a section discussing memory and instinct, he emphasises the fact that the manner in which our memories are preserved strikes at the root of any theory which would explain the universe only in terms of chemical and physical forces. A section on astronomy and the possibilities of human life or life in any form on other planets brings us to a long concluding section in which the great ethical and religious situations now placed before the reader are discussed, together with the arguments for a belief in the hereafter.

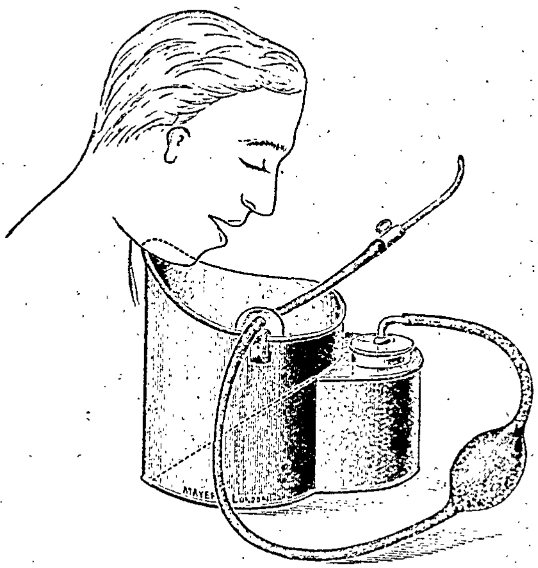
If there is no hereafter, the author pleads as the result of his arguments, not only will the evolutionary process to all intents and purposes have run its course in vain, but in vain will have been all men's efforts to bring their wills into harmony with God's through obedience to those higher impulsions which He Himself has put within them. The difficulties lying ahead of any writer who attempts to answer the fundamental questions involved in such an inquiry are familiar to everyone, and readers will judge for themselves whether the author's arguments establish what he so ardently hopes to be true. But his attempt to re-enforce faith in religion and to abate scepticism by reasoned argument is worthy of great praise for the labour expounded.

New Inventions.

A LAVAGE APPLIANCE.

MAINLY FOR THE ACCESSORY NASAL SINUSES.

UNLESS a gravity douche can is used the lavage of the accessory sinuses implies the holding by the patient, the nurse, and the surgeon between them two more or less clumsy vessels, the lotion holder and the receiver, both of which usually slop over, and a detached syringe. The apparatus illustrated is an attempt to overcome all these difficulties by combining the two chambers in one appliance. The can is held by the patient and the surgeon or nurse has both hands free to control the cannula and the syringe, which is securely held by its detachable fastener to the can. An assistant is not required and, if necessary, the patient, by placing the can on a table, is able to carry out the lavage unaided and in comparative comfort. The clip on the Higginson syringe is detachable.



The apparatus (which is shown disproportionately large) could be used equally well for eyes, ears, or any other part of the body, and in almost any position.

This model has been made for me by Messrs. Mayer and Phelps.

HUGH E. JONES, L.R.C.P. Lond., M.R.C.S. Eng.

THE LANCET.

ONDON: SATURDAY, APRIL 13, 1929.

N THE PASSING OF MUCH WATER.

YURIA is a symptom met with in many conditions,
ng from the heightened nervous tension asso-
l with (say) a medical examination for life
ance, when it appears in transient form, to the
nued passage of large quantities of urine in
is states such as diabetes insipidus and chronic
e of the kidney. In his Goulstonian lectures,
publication is complete in our present issue,
E. B. VERNEY has attempted to interpret the
logical polyuria of these two conditions in
of the findings and theories of experimental
ology. It has long been known that the polyuria
abetes insipidus can be controlled by the sub-
eous injection of an extract of the posterior lobe
e pituitary gland, and the natural conclusion has
drawn that the symptom is due essentially
me interference with the function of that body.
clinical observation has shown that destruction
isease of the whole hypophysis is not necessarily
wed by diabetes insipidus, while the results of
rimental extirpation of the gland have been
licting. The view, therefore, has been advanced
the polyuria is due to a disturbance of the
othalamus, leading to a failure of this part of the
n to regulate the output of water and chloride
the kidney, and is not directly due to a lack of
itary secretion. In a series of ingenious experi-
ts Prof. VERNEY demonstrates how the gradually
easing polyuria which develops when the isolated
ey is perfused in a heart-lung preparation can be
bited in a remarkable fashion, not only by adding
itary extract to the circulating fluid but also by
usion with the blood passing through the head
neck of another animal. He further shows that
n the pituitary body is removed from this animal
yuria is re-established. From these and other
eriments he concludes that the polyurias associated
h diabetes insipidus, with water ingestion, and
h isolation of the kidney, have an immediate
ology common to all—viz., a decline in the amount
antidiuretic hormone normally secreted by the
uitary gland into the circulating blood stream.
d he puts forward the interesting speculation
t in the development of vertebrate animals upwards
m the fish and amphibian, the demand for an
reased control over the salt-and-water metabolism
the body has been met by a corresponding change
the function of the pituitary gland.

n his second lecture Prof. VERNEY examines from
ew angle ROSE BRADFORD's fundamental observa-
ns on the effects of reducing by surgical means the
ount of kidney tissue in the dog. ROSE BRADFORD
l shown that after the removal of even a small
ount of the kidney it was exceptional for the urine
return to its original quantity and density, the
st usual result being a distinct increase in the
nary water. By perfusing in parallel two kidneys
the isolated state, Prof. VERNEY and his colleagues
nd that the functional removal of half of one
ney by tying a primary branch of the renal artery,
ulted in an immediate and similar polyuria from
t organ. It was found, further, that the chloride
cretion was increased relatively or even absolutely, but that there was a *profound fall in both* the percentage and absolute amounts of urea eliminated. The reduced kidney, in fact, responded at constant blood pressure exactly as though it were being subjected to an increase in perfusion pressure. What is the precise mechanism culminating in this response is not clear, but from the conditions of the experiment it obviously must be a strictly local one. On the basis of these experiments and the results of recent work on the physiology of the kidney, the lecturer seeks to explain the well-known series of events in chronic nephritis—the early disappearance of the rapid swings in the rate of urine eliminated by the healthy kidney during the daytime, the increase in volume passed during the night, the slight variation in the earlier stages from the normal in the water excretion, urea concentration, and chloride concentration tests with little or no rise in blood pressure, followed by increasing loss of kidney function, persistent rise of blood pressure and, finally, death from renal failure. He assumes that some toxin applied continuously or discontinuously to the glomerular vasculature leads to a gradual diminution in the efficiency of the renal units. Each must work longer to fulfil its function (of maintaining the constancy of composition of the "milieu interne") with the result that there is first a reduction in the normal periods of quiescence, and later increased activity night as well as day. The death of some of the units leads to the development of a greater pressure stimulus on the others with resulting secretion of a more copious urine which approaches the plasma in its composition. In time this intrinsically developed pressure is not sufficient, and a higher general blood pressure is demanded to increase the circulation through the kidney. This sustained rise in blood pressure is contributed to, Prof. VERNEY thinks, by a change in the activity of the vasomotor centre, resulting either reflexly from the kidney or from the presence in the circulation of abnormal substances.

The Goulstonian lectures are, in fact, full of highly interesting speculations, but the lecturer wisely asks, how are all these mechanisms correlated and integrated in the struggle to preserve the composition of the body fluids at their optimum? That question, as Prof. VERNEY remarks, is as yet unanswered.

PUBLIC CLEANSING IN GREATER LONDON.

SOME three years ago a deputation from the London County Council urged upon the Minister of Health the need for investigation of the means taken in London for the disposal of house or other refuse. The Council had received complaints of the nuisance caused to their new housing estate at Becontree by the large dumps of refuse at South Hornchurch, which had been accumulating for more than 50 years. These dumps, in some places 90 feet high, are used chiefly for the deposit of house and trade refuse from the cities of London and Westminster, the annual increment being in the neighbourhood of 350,000 tons, an amount probably in excess of that collected annually in Manchester. Although at the start these dumps were remote from a populated area, and more or less unnoticed, they now present a huge disfiguring mass, the peculiar smell from which is said to reach the southern part of the Becontree Housing Estate; they are frequently on fire, and the cloud of smoke may reach the houses now being erected within the urban district of Hornchurch. These and all the large uncovered riverside dumps are extensive fly-breeding grounds; the amount of rat infestation is also very great. They pollute the surface water in the large shallow pools as well as the open drainage channels in the marshland. Authorities of other areas outside London, chiefly in West Middlesex, where smaller editions of the Hornchurch dumps are found, have protested against their districts being made dumping grounds for refuse from other areas. Nuisance, however, is not inevitable with dumping. At Northolt, for example, where frequent complaints were made a few years ago, there has been little, if any, objection raised since direct labour has been employed and the principle has been adopted of dumping in shallow layers and covering the fresh refuse with suitable innocuous material. In Hertfordshire and Bedfordshire, where great quantities of London refuse are dumped, complaints have been forestalled and conditions greatly improved as the result of careful management on the lines of the tipping precautions laid down by the Ministry of Health.

In his recent report[1] to the Ministry, Mr. J. C. Dawes takes the view that the present system of barging to dumps is open to criticism, especially as there is little effective competition between the contractors concerned, who have no regard for sanitary principles. The mounds created in the course of brick-making are a case in point. Hundreds of millions of so-called stock bricks are made every year, especially in the vicinity of Sittingbourne, with the aid of London household refuse; "fine ashes" or dust must be added to the virgin earth, "cinder" or breeze being commonly the only fuel used in the clamps to burn the brick. The brick-making industry appears capable of utilising some 700 of the 3000 to 5000 tons of refuse produced daily in London. Many brickmakers consider that household refuse should be allowed to stand before use; the fine ash content is thereby increased, possibly by the breaking down of the organic matter in which it is lying or to which it is attached, and from which in the fresh state it cannot be separated. But during this period of maturing a nuisance is produced which, unfortunately, cannot be met by covering with soil. Mr. Dawes suggests the making of a technical investigation by the industry to determine the possibility of using only separated ashes and breeze, holding out the inducement that these two items may cost them less than the crude refuse.

The magnitude of the problem is clearly seen from Mr. Dawes's report. In the years 1925–26, the collection of 1,130,000 tons of London house refuse and 72,000 tons of trade refuse cost the huge sum of £660,460, or 11*s.* per ton; its disposal required another £448,809, at the rate of 7*s.* 6*d.* a ton; and, in addition, street cleansing cost £1,086,118. The main gist of the report is that expenditure could be reduced by the formation of a central cleansing body for Greater London, to undertake both collection and disposal. Such a procedure has its precedent in the Metropolitan Water Board, and in the arrangements, less complete it is true, for the common disposal of sewage from the metropolitan boroughs and some of the areas adjoining London. The pooling of water-supply or sewage disposal was simplified by the fact that most, if not all, of the component factors of these problems had long been known and, to some extent, worked out. In the collection of house refuse, although the requisites are known—for it is obvious that the refuse must be stored on premises in a sanitary manner, and the material collected by methods which avoid the scattering of dust—we have by no means reached any final solution, although those responsible for the work in London and its vicinity have been active in their search. Experimental work is being done on the methods of collection, the best receptacle used, and the mode of its storage on premises, the most suitable type of dust collecting vehicle; on the disposal side, improved methods of dealing with tips have been devised and employed, improvements have been made in the construction of dust incinerators and in the utilisation of the constituents of refuse, both before and after incineration. Seeing that London represents almost the largest conglomeration of dwellings and premises in the world, and the difficulties bear some proportion to the size of the area concerned, the measure of success already achieved is gratifying. But any committee appointed to consider the question of giving effect to the report will be confronted with difficulties owing to the absence of accurate data. No doubt by the extended exercise of existing powers a reduction could be made in the cost of collection, caused by overlapping of refuse collection and street cleansing services; on boundary roads between boroughs, for instance, refuse is collected and the roads are cleansed at the present time by different local authorities. Section 140 of the Metropolis Management Act, 1855, enables the London County Council to order that any street or line of street, which is in more than one borough, shall be placed under the exclusive management of one of the borough councils for such purposes as cleansing. The difficulties and expense of accurate costing will militate against the committee's obtaining reliable evidence as to the further possibility of reducing by any appreciable amount the cost of collection; in fact, it would seem probable that the adoption of methods of collection tending to increase its amenities will increase the cost. In the absence of suggestions for improvement of the best known methods of disposal at present available and already in force, it is difficult to see what can be done beyond recommending the extended adoption of these methods. In the near future it should be feasible to mitigate the nuisance caused by incineration plants, and it is not too much to hope that the attempts to use crude refuse as a fuel to produce steam for the generation of electricity will be better rewarded. When a measure of success has been obtained in both these directions it is possible that certain geographical combinations of London might bring about the extended use of inoffensive incinerators helping in the supply of electricity. A proposition more ready for application at the present time would be concerted action to reclaim by dumping the low-lying marshland on the banks of the Thames, incidentally a means of providing unskilled work for the unemployed.

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CANCER OF THE LUNG.

An important contribution to the study of cancer of the lung has lately been made by Dr. Georgiana Bonser,[1] who has compiled a statistical record of all the cases of intrathoracic tumour reported in the post-mortem room of the Leeds General Infirmary during the last 37 years. Her work is of special importance because her figures, unlike most of their kind, afford no evidence of an increase in the incidence of these tumours in recent years. The average percentage for the 37 years was 1·06, the highest figure, 1·30 per cent., occurring in the period 1908–12. This question of an increase in the incidence of intrathoracic tumours, a considerable proportion of which appear to be carcinomas of the bronchi, naturally interests cancer workers because it is surmised that air pollution may play a part in the ætiology of the condition. It has undoubtedly seemed to many pathologists, both in Europe and in America, that this form of growth is seen in the post-mortem room relatively more often than formerly, and in most places the figures, when analysed, have shown that this is indeed the case. Nevertheless it is fully appreciated that fluctuations in post-mortem room statistics may depend more on selection of suitable cases for demonstration purposes than on the actual incidence of the disease in the population. In Leeds this factor has not played a great part because, as Dr. Bonser points out, over 83 per cent. of all persons dying in the hospital during the last 37 years have been examined at autopsy. This is certainly an unusually high percentage for a hospital in this country and it makes her findings all the more significant. In 1927 J. B. Duguid[2] collected the cases from the post-mortem records of the last 60 years in the Manchester Royal Infirmary, and there it was found that the incidence was unusually high—on an average more than twice as high as that in Leeds—and that it was steadily on the increase. Since Manchester is especially notorious in respect of atmospheric pollution, comparison of the figures with those of other less industrial towns was expected to furnish some information about the relation of this form of new growth to the degree of contamination of the air. It is perhaps fortunate for the advancement of medical science that the first comparison was made by Dr. Bonser in Leeds, for the atmospheric conditions in that city are so far comparable with those of Manchester as to render the Leeds figures more suitable as a control to the Manchester ones than as a contrast to them. At all events the difference in the incidence of the tumours in the two towns was far greater than the difference in their atmospheric conditions, and factors other than air pollution must be considered as influencing the figures. Dr. Bonser further demonstrates how complicated is the problem by showing that although the incidence in the post-mortem room at Leeds has not increased, the percentage incidence in the wards of the hospital has shown a definite rise since 1914. She rightly suggests that improved methods of diagnosis and a greater clinical interest in pulmonary cancers of late years may be responsible for this, and it is evident that statistics gathered from the post-mortem records of general hospitals, while they give useful information on the nature of intrathoracic tumours, may yield very doubtful and conflicting evidence about the incidence of the disease either in the general population, or even in the wards of the hospital itself. Dr. Bonser's paper has strengthened the suspicion that the much discussed increase in lung cancers may be no more than apparent. In Leeds the occupational incidence reveals nothing of significance. The age and sex incidence is similar to that found in most other hospitals, the proportion of male cases to female being about 3½ : 1. But Dr. Bonser shows that in Leeds the proportion of male to female autopsies is roughly 3 : 2, and she is to be congratulated on being the first writer on this subject to publish, along with the incidence, figures showing what proportion of all deaths in the hospital go to post-mortem examination. It will be seen that this information greatly helps in assessing the true value of the figures, for it indicates that the disproportion between the sexes is not so great as at first appears.

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[1] Public Cleansing, being a Report of an Investigation into the Public Cleansing Service in the Administrative County of London. By J. C. Dawes, O.B.E., M.I.Mech.E., Inspector of Public Cleansing, &c., Ministry of Health, H.M. Stationery Office, 15*s.*

[1] Jour. of Hygiene, 1929, xxviii., 340.

Dr. T. C. Hunt's paper, which appears on p. 759 of our present issue, treats the subject of cancer of the lung more from the clinical point of view, but attention is paid to the previous histories of pulmonary affections and their bearing on the ætiology. Of the 26 cases reported by Dr. Hunt from St. Mary's Hospital, half gave a history of previous disease of the lung. Influenza, which has been cited as an important ætiological factor, was reported in not more than a quarter of his cases. A similar proportion—about 30 per cent.—was revealed in a recent report by B. R. Kirklin, R. Paterson, and P. P. Vinson on 68 cases of pulmonary tumour from the Mayo Clinic, and these authors justly remark that this incidence is not unduly high in view of the recent pandemics. Indeed, with the prevalence of the condition or conditions which the laity loosely term "influenza," it is surprising that so few of the patients claimed to have suffered from it. Tuberculosis, from these reports, does not appear to be a very common associate of lung cancer. Bonser found record of old or active tuberculosis in 26 of her 172 cases, Hunt finds it in only 2 in his 26, and Kirklin in none of the 68 cases from the Mayo Clinic, so that respiratory infections do not seem to play a very important part in the ætiology. Dr. Hunt draws special attention to the frequency with which pain marks the onset of symptoms in cancer, in contrast to phthisis in which pain is a comparatively uncommon early symptom. This is undoubtedly one of the most valuable points in differential diagnosis, and attention to it may make the early recognition of pulmonary cancer more certain. Perhaps many of the difficulties in diagnosis will be dispersed when it becomes more widely recognised that these tumours are fairly common, and are always to be borne in mind when investigating a chest case. The idea that lung cancers are little known rarities, only to be encountered once or twice in a lifetime, unfortunately dies hard.

Annotations.

"Ne quid nimis."

THE BRITISH CONGRESS OF OBSTETRICS AND GYNÆCOLOGY.

Dr. Gibbon FitzGibbon will preside over the seventh British Congress of Obstetrics and Gynæcology which meets at Dublin on the 24th of this month. The proceedings open with a discussion on the Management of Cases of Pelvic Disproportion, at which the speakers will be Prof. Munro Kerr, Prof. Fletcher Shaw, Dr. James Young, Dr. J. D. Barris, Dr. Bethel Solomons, and Dr. W. Taylor. This discussion will occupy both morning and afternoon, and in the evening the President and Mrs. FitzGibbon will entertain members of the Congress and their friends at the Royal College of Surgeons, St. Stephen's Green. Communications on the two following days are to include papers on metropathia hæmorrhagica (Dr. Wilfred Shaw), the complications of ovarian tumours (Prof. James Hendry), the use of glycerine in obstetrics and gynæcology (Dr. Caroline Elliott), double monsters (Dr. A. L. Mudaliar), eclampsia and its renal lesions (Mr. R. H. Paramore), mercurochrome in urinary infections in pregnancy (Prof. D. C. Rayner), the basic cause of cervical cancer (Dr. K. V. Bailey), fœtal death following quinine induction (Mr. A. A. Gemmell), the technique of radium application in uterine carcinoma (Mr. Gilbert Strachan), and pregnancy following X ray stimulation of the ovaries (Prof. Miles Phillips). The official guests of the Congress are Prof. John Osborn Polak, of New York, who will contribute a paper on Follow-up Results in 500 Cases of Uterine Hæmorrhage of Non-malignant Origin, and Prof. Ludwig Adler, of Vienna. An exhibition of pathological specimens has been arranged in the Royal College of Physicians, and will be open for inspection after midday on Wednesday. Those who have specimens to show are requested to communicate with Dr. J. Lait, School of Pathology, Trinity College, Dublin, without delay; drawings or photographs of interesting cases or specimens being also welcome. The Congress dinner will be held at the Royal College of Surgeons at 7.45 P.M. on Thursday, the 25th, and the sessions will end at 1 P.M. on Friday, the afternoon being reserved for operative demonstrations. The hon. secretaries of the Congress are Dr. Bethel Solomons, Master of the Rotunda Hospital, and Dr. Gerald Tierney, 22, Lower Baggot-street, Dublin. The meetings will take place in the hall of the Royal College of Physicians in Kildare-street.

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[2] The Lancet, 1927, ii., 111.

THE FLEA AT SEA.

ONE of the most important measures for preventing the spread of bubonic plague is the elimination of flea-bearing rats from ships. For some years now the English and Australian health authorities have been searching incoming ships for signs of rat infestation as a preliminary and guide to anti-plague measures. In 1925 C. V. Akin and G. C. Sherrard showed that rat infestation could be estimated very accurately, but when a ship is heavily infested no amount of fumigation seems to clear it. Several observers have shown that rats can be trapped on ships after fumigation, and this fact must be due to the presence of retreats in the ship's structure where rats can go but fumes cannot reach. For this reason rat-proofing of vessels has been advocated, for even if it does not in fact make the ship rat-proof it makes it much more vulnerable to fumigation. That it takes a long time to establish a rat-colony on a properly cleared ship has been shown in a recent paper by C. L. Williams, of the United States Public Health Service.[1] He investigated 1913 "ships" in New York harbour during two years, each fumigation counting as a "ship" in this enumeration. The rats were almost exclusively the black rat and his close relative the Alexandrine rat. As would be expected, twice as many rats were found on ships carrying a cargo suitable for rat food than on the others, and the nature of the cargo seemed to be the major rat-influencing factor. An outstanding result of the investigation was that the majority of rats are carried by relatively few ships and that most ships carry few rats. Only about 10 per cent. of the ships arriving at New York were heavily infested (more than 30 rats), and these are the vessels that constitute a menace to the public health. The really large rat colonies were found in ships fumigated at intervals greater than four months. Apparently the majority of ships return to their normal rat population about five months after fumigation, and ships found free of rats at one fumigation are usually free at the next one, whether this be two, three, or six months later. The obvious conclusion is that most ship rats are born on the ships they infest and that fumigation of every ship is a waste of money. Better results would be obtained by concentration on the few ships known to be infested. It is clear, however, that if this were to become the practice quarantine officers would have to keep a very careful look-out for new infestations, which do, of course, occur from time to time. For instance, a South American coaster yielded only seven rats on the first 13 fumigations while the fourteenth produced 143; the officers testified that the rats all came aboard in a single cargo of potatoes.

Another important observation made by Mr. Williams is that only two varieties of flea were found on ship rats in sufficient numbers to be of practical importance. These were *Xenopsylla cheopis* and *Ceratophyllus fasciatus*; other varieties were apparently only accidental passengers. His results agree with those of J. C. Gauthier and A. Raybaud at Marseilles, of W. Fromme at Hamburg, and of Newstead and Evans in Liverpool in finding *X. cheopis* by far the commonest flea. C. Tirboschi, at Genoa, S. Kitasato in Yokohama, and Schastry in Odessa found no other flea at all in their surveys of ship rats. The flea catch in New York varied quite definitely with the temperature, but humidity made little difference. Below 50° or 55° F. the numbers were very low, but the slower reaction rate of a fumigant in cold weather must be taken into account before assuming that there are far fewer fleas on rats in the winter. Probably both factors operate. Most of the fleas came from the Caribbean and the east coast of South America; ships plying only between northern ports harboured mainly *C. fasciatus* and did not seem to be a grave plague menace. The southern ships mostly carried rat-food cargoes, touched at many ports, and entered dock in most places. Sugar ships as a class had few rats and no fleas. The fumigant used had considerable influence on the number of fleas found; when Zyklon B was employed less than half as many fleas per rat were found as when generated gas or sprayed liquid were used.

As a result of his investigation Mr. Williams recommends that removal or closure of rat harbourages in ships should be required; that complete rat eradication should be substituted for the specified two hours' exposure to fumigation, and that ships should be fumigated on the basis of observed rat infestation, after giving due consideration to the potentialities for plague infection in each case. He adds that it is essential that inspections should be made only by highly efficient, conscientious, skilful employees who have undergone a lengthy period of special training.

OLEOTHORAX.

INTRAPLEURAL injections of antiseptic oil were advocated by Bernou in 1922 in the treatment of purulent tuberculous effusions and pleuro-pulmonary perforations. For this purpose a volatile antiseptic dissolved in olive oil or paraffin was injected in an amount sufficient to fill the affected pleural cavity. The particular antiseptic used by Bernou was the somewhat mysterious French proprietary remedy known as gomenol, believed to be a distillate from the leaves of niavul (*Melaleuca viridiflora*). The success attained by the method soon led to its wider application, particularly in the treatment of progressive pleural adhesions in cases of artificial pneumothorax. A. Courcoux and A. Bidermann,[1] in a recent contribution, point out that the beneficial effects of oleothorax depend on its mechanical action in maintaining a positive pleural pressure and in separating pleural surfaces which would otherwise adhere and on its antiseptic action in chronic purulent tuberculous pleurisies. The success of artificial pneumothorax treatment is often threatened by the formation of pleural adhesions which cause a progressive reduction of the pleural cavity and a corresponding re-expansion of the underlying lung. In such cases the usual practice is to raise the pleural pressure and shorten the intervals at which refills are given, but the resulting benefit is, as a rule, only temporary. The substitution of oil for air prevents contact between pleural surfaces and enables a more constant pressure to be maintained. If success is to be obtained the pleura must be completely filled with the oil and rigorous control by X ray observations is essential. Undue mobility of the mediastinum which yields before a positive pressure and prevents adequate collapse of the diseased lung is another occasional cause of failure in artificial pneumothorax treatment. The authors suggest that in such cases small injections of oil may provoke local reactions, the formation of mediastinal adhesions, and consequent fixation. They hold that there is no evidence that the oil has a solvent action on adhesions, but that the pleura tends to thicken under its action. This effect may indeed lead to disastrous results, for in the presence of dense adhesions a weak-walled pulmonary cavity may rupture if the pleural pressures are raised too high. In purulent tuberculous pleurisies oleothorax is the method of choice if air replacement has failed to prevent reaccumulation or if secondary infection has occurred. Other indications for the induction of oleothorax are small pleuro-pulmonary perforations, too rapid absorption of air in an otherwise successful artificial pneumothorax, and when for any reason frequent refills are undesirable. In this country F. G. Chandler[2] has suggested oleothorax in the treatment of bronchiectasis, a condition in which artificial pneumothorax treatment seldom causes a satisfactory collapse of the diseased lung. Before commencing oleothorax treatment a preliminary injection of oil should always be given. If the pleural membrane is unduly sensitive a sharp reaction may occur manifested by pyrexia and effusion. In such cases caution will be necessary. Pleural shock may endanger life in this as in other forms of treatment involving pleural puncture. Too hasty raising of pressures may result in pulmonary rupture, while if a broncho-pleural fistula is patent the injection of oil may cause acute distress. A wise selection of cases and a careful technique are essential if success is to be attained.

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[1] Public Health Reports, March 1st, 1929.

[1] Paris Médical, 1929, xix., 15.

PROGNOSIS IN HAY FEVER.

INOCULATION against hay fever should preferably begin by March, but many a sufferer from this complaint had forgotten what is in store for him until reminded by the spell of fine weather which we have been having. The practitioner faced with a request for prophylaxis will find guidance in an article,[3] contributed by Dr. John Freeman to our series on Modern Technique in Treatment, but, needless to say, a certain number of people are unwilling to take a course of injections unless convinced that they will gain a more than passing benefit. This question of ultimate prognosis has lately been dealt with by Dr. F. M. Rackemann,[4] of Harvard University, and it may be of interest to summarise his conclusions. "Every patient," he says, "wants to know what are the chances that the treatment of *his* hay fever in any one year will lead to results which will be permanent, and if not permanent, whether the immediate procedures will modify other treatment in later years." The answer to these questions is attempted by a scrutiny of the results of treatment, mainly by pollen injections, of 410 persons suffering from hay fever caused by ragweed. Only those who began their treatment in or before the season of 1925 and who were followed up for at least two years, are included in the tables. The number freed from the attacks for two successive years or more is disappointingly small—namely, 26, or 6·3 per cent. A review of the causes of this smallness shows several important features. Rackemann believes that a cure cannot be assured by persistent annual repetition of treatment; indeed, patients who need such annual repetition are unlikely to be cured by the methods at present available. In the small cured group the extent of the cure amounts to freedom for an average period of four years only. Thus far, and no further, do the present data warrant any conclusion. Statistics give the impression that the therapeutic extracts vary slightly in different years, and Rackemann goes so far as to say that "relief of hay fever is not always and necessarily dependent upon the particular treatment." These results, as he says, are distinctly disappointing, but more encouragement can be derived from his other deductions that an "improved" patient has a good chance of ultimately joining the "cured" group, and that in patients requiring annual courses, fewer and fewer inoculations will be necessary. The paper concludes with observations that dermal and general constitutional sensitiveness often persists long after clinical improvement is reached. Cure of hay fever by inoculation is clinical rather than truly immunological, and it is suggested that the conjunctival and nasal mucous membranes may become locally less sensitive.

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[2] Tubercle, 1927, viii., 563.
[3] THE LANCET, 1927, i., 940.
[4] Amer. Jour. Med. Sci., March, 1929, p. 333.

THE POTATO AS CULTURE MEDIUM.

FOR the most distinguished research in the field of tuberculosis during the year 1928 the award of the American Association for the Advancement of Science has gone to Dr. H. J. Corper and Dr. Nao Uyei, of Denver. For some time these workers have been looking for a culture medium for the tubercle bacillus which would rival guinea-pig inoculation test in making a diagnosis. Of existing media Calmette's potato-cylinder was found to be the most efficient for growth of the bacillus in high dilution; but this medium had the disadvantage that it was also a suitable pabulum for contaminating organisms. In order to get rid of the latter the Denver doctors treat the supposedly tuberculous material with an equal volume of either 6 per cent. sulphuric acid or 3 per cent. hydrochloric acid and mix thoroughly in a centrifuge. Further, the growth-promoting properties of the *potato-cylinder were enhanced by the addition of small* quantities of a dye—viz., crystal violet—the most favourable dilution of this was found to be 1 part in 75,000. Their latest observations[1] show that they have been engaged in further simplification of their method and in comparing its value in practical tests on sputum, urine, and animal tissues with Petroff's method and with guinea-pig inoculation. They attempted to substitute a medium with ground potato for the crystal violet potato-cylinder broth medium previously described. At first they were unsuccessful, for the grinding in some way spoiled the potato. But it was found that if the potatoes are autoclaved for 30 minutes at 15 lb. pressure before being ground a successful glycerol-crystal-violet-potato-agar medium may be prepared. Exact proportions are still the subject of investigation, but it already appears that the glycerol content must be about 2–2½ per cent. and that the concentration of the dye should be only about *one-fifth* of that used in the potato-cylinder medium. In actual successes, or positive findings, the new method has proved equal to guinea-pig inoculation and definitely superior to the sodium-hydroxide-gentian-violet-egg medium. Among the practical advantages over guinea-pig inoculation may be mentioned economy, possibility of repeated observations, and the availability of a culture when positive.

THE XANTHOPROTEIC REACTION IN RENAL DISEASE.

THE grave clinical phenomena of true uræmia cannot with certainty be attributed to any of the substances investigated in this connexion such as urea, the amino-acids, uric acid, or creatin. It is only a few years since Becher and others have taken into particular consideration in investigating uræmic poisoning a group of substances of the aromatic series, such as indican, which are derived from intestinal putrefaction. Such substances, which are highly toxic, by their passage through the liver undergo a process of oxidation which renders them less toxic and rapidly eliminated by the urine. In normal conditions they are found in the blood in very small quantities, while in renal insufficiency they accumulate in large amounts. Becher with a special technique has instituted a xanthoproteic reaction to estimate the amount of soluble aromatic substances present in the blood. F. Tonietti, of the Institute of Clinical Medicine at Rome[2] has made a series of observations on 68 cases estimating the xanthoproteic reaction by Becher's method, using Ambard's formula for the urea index, and Jolles's test for indican in the blood by way of comparison. He found in numerous patients with acute glomerular nephritis the reaction was within normal limits, the same being true of the indican and nitrogen content. In a case of uræmia with convulsions occurring during the course of acute nephritis with a high nitrogen retention the xanthoproteic reaction was negative. This is an interesting fact to which Becher has also called attention—namely, that in the course of acute nephritis even when convulsive seizures manifest themselves the permeability of the kidney to the aromatic group remains good. Negative results were obtained in patients with renal tuberculosis, syphilitic nephrosis, and in nephrosis of pregnancy. In cases of diffuse chronic nephritis in various stages in which symptoms of uræmic intoxication were absent, the Xanthoproteic reaction showed a tendency to rise above normal, but in instances of grave symptoms of true renal insufficiency with more or less marked signs of uræmia the reaction reached a high degree indicating the retention of aromatic substances in the blood. The highest values were found in cases of uræmic coma and in primary or secondary renal sclerosis with uræmic intoxication. It is worthy of note that consecutive examinations showed an accentuation of the xanthoproteic reaction parallel with an aggravation in the symptoms and, on the other hand, it descended to normal limits with the disappearance of these symptoms. In these cases there is an evident agreement between the retention of aromatic substances in the blood and the occurrence of that form of uræmic that goes under the name of true uræmia in contradistinction to the slow and progressive course of grave toxic nervous symptoms of depressive type. On the other hand, in uræmia with convulsions the permeability of the kidneys to aromatic substances remains good and if this phenomenon is, according to Becher, a proof of a real difference between these two forms of uræmia, it is easy to understand how the evidence of an accumulation of such aromatic substances in the blood may have an important diagnostic value inasmuch as it allows these two forms of uræmia to be differentiated by a chemical reaction of very simple technique. There seems to be a certain degree of agreement between indicanæmia and the xanthoproteic reaction. In none of the patients with acute nephritis was the titre above normal, and all those with true renal sclerosis with more or less severe symptoms of uræmic poisoning showed a high titre, but while in some cases of uræmic convulsions the indicanæmia reached a high figure, in others with an equally grave symptomatology the amount was much lower. Hence the xanthoproteic reaction seems to be in greater agreement with the clinical symptoms of uræmia than does the amount of indican in the blood. From these observations of Dr. Tonietti it would seem that the xanthoproteic reaction is normal in cases of renal disease without renal insufficiency, and that in renal sclerosis it shows retention of aromatic substances in the blood when symptoms of absolute renal insufficiency make their appearance. Moreover, in true uræmia and anuria of whatever nature, the xanthoproteic reaction reaches high figures and this increase or persistence is of unfavourable import. Finally, although this reaction by no means always runs parallel with the level of indican and urea in the blood, it is in more constant agreement with the symptoms of renal insufficiency than the other two.

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[1] Journal of Lab. and Clinical Medicine, 1929, xiv., 393.
[2] Policlinico. Med. Sect., xxxvi., March 1st, 1929, p. 163.

OCCUPATIONAL ANÆMIAS.

MUCH of our knowledge of the anæmias has come from occupational toxicology—from such apparently diverse sources as research on chronic benzene poisoning, toxæmias from amido- and nitro-derivatives of benzene, and the distribution of lead in the tissues in cases of plumbism. Facts associated with a fresh hazard now seem to link up the whole. This hazard is associated with the absorption of mesothorium into the body while applying luminous paints to watch-dials. Girls doing this work adopted the habit of pointing their paint brushes between their lips and so could in a week swallow from 7 to 200 microgrammes of radio-active substances, since the paint contained mesothorium and zinc sulphide. Not less than 15 girls who were thus employed in New Jersey broke down in health and died, often exhibiting symptoms similar to phosphorus necrosis, and a good deal of publicity in the United States has been given to these cases, much research being devoted to their elucidation. Dr. H. S. Martland, who has now summarised the whole story in two useful papers,[1] says that mesothorium when swallowed is absorbed and finally deposited, like lead, as an insoluble sulphate in the bones. Here it decays and disintegrates, giving off injurious alpha rays in the process. Should there be any septic infection, as, for instance, in the mouth, bone necrosis follows; but otherwise these injurious rays bombard and damage the neighbouring hæmopoietic bone-marrow. Hence may result leucopenic anæmia of the regenerative type with the presence of basophilic red cells, the condition, although more acute, recalling the anæmia of lead poisoning. Should this stage be survived, a more chronic type of disease may develop with low-grade crippling osteitis and aplastic anæmia. The condition of the blood now resembles that seen in chronic benzene poisoning, and apparently the marrow is so damaged as no longer to function. Contact with radio-active substances and X rays is a recognised cause of anæmia, either regenerative or aplastic in type. In the case of the New Jersey painters the existence of mesothorium was demonstrated during life by detecting emanations in their expired breath and after death by examining the tissues, when the bones in particular and the spleen were found to be depositories of this substance. No treatment can be of avail once the insoluble sulphate of mesotherium is laid down in the bones, and only time can help. Mesothorium decays half away in 6·7 years; in 12 years, therefore, a survivor should be safe. No case of poisoning has come to light in the watch industry in Europe or elsewhere, but only in America was the habit adopted of pointing the brushes with the lips. Knowledge of causation is naturally followed by abolition of risk, and so this occupational disease must disappear. But it will continue to live for the light it has shed upon the occurrence of anæmias.

THE METABOLISM OF THE ESKIMO.

THOSE conscientiously engaged in the elucidation of physiological problems by means of animal experiments must have constantly before their minds the knowledge that the results obtained with one species of animal may not necessarily apply to another species. Even different races or breeds of the same species of animal may show striking differences in their physiological behaviour. For instance, it has been shown that alone, among the breeds of dog, the Dalmatian has the capacity of excreting large amounts of uric acid in the urine. It should not, therefore, be altogether surprising if among the races of mankind we meet with fundamental differences in normal metabolic processes. The Eskimos are peculiar among human races in that their usual food consists almost entirely of protein and fat. Virtually the only source of carbohydrate in their diet is the glycogen present in the meat they consume, for the geographical conditions under which they live are such that, at least during the greater part of the year, it is impossible for them to obtain carbohydrate from any plant source. According to Heinbecker,[2] who has recently published a report on certain aspects of the metabolism of the Eskimos, from one-third to one-half of the total quantity of food eaten by them in cold weather is in the form of fat; in the warmer weather fat might furnish only one-seventh of the total quantity. Even when the maximal amount of fat is eaten, however, the Eskimos showed no signs of ketosis. The protein which makes up the rest of their dietary furnishes potential supplies of carbohydrate, and it has been suggested that such carbohydrate may be formed in sufficiently large amounts to counteract the ketogenic effect of the fat consumed. However, Heinbecker made some observations on the effect of starvation on the excretion of ketone bodies by Eskimos and found that they showed a very much milder degree of ketosis than is observed with fasting men belonging to other races. He suggests that there may be two fundamentally different mechanisms for dealing with fat in the human body, only one of which may require the simultaneous katabolism of carbohydrate. The Eskimos appear to need less carbohydrate to burn up fat than other races, and this may mean that their consistently low carbohydrate diet is associated with an increase in the effectiveness of that secondary mechanism which is independent of carbohydrate. He does not discuss the question whether this second mechanism is inherited in a peculiarly effective degree as a racial characteristic, or whether it is a result of individual adaptation to the prevailing dietetic conditions. The Eskimos were found to have an extremely good tolerance for carbohydrates. In fact, their blood showed rather less than the normal rise in sugar content after the ingestion of large quantities of sugar, and sugar never appeared in the urine under these conditions unless the subjects had previously been starved. There was, therefore, no hereditary or acquired alteration in their capacity for dealing with carbohydrates. One other point of interest emerged from Heinbecker's observations—namely, that the long-continued consumption of what would ordinarily be considered excessive quantities of protein had no demonstrable ill-effects on the Eskimos. They could deal perfectly well with the large quantities of nitrogenous material supplied to them and in no single case were signs of renal insufficiency met with. There is no need to assume that we are dealing here with any racial characteristic, for arctic explorers of European extraction have reported that after many years of living under similar dietetic conditions there have been no signs of any impairment in the efficiency of their renal or vascular systems.

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[1] Jour. Amer. Med. Assoc., Feb. 9th and 16th.

[2] Heinbecker, P.: Studies on the Metabolism of Eskimos. Jour. Biol. Chem., 1928, lxxx., 461.

RESEARCH ON ANÆSTHESIA: THE HICKMAN MEMORIAL.

THE appeal published in our correspondence columns, over the signature of Mr. Cecil Hughes, for initiating further research on anæsthesia is one that will commend itself at once to the medical profession in this country. It is noticeable that while the first great steps in anæsthesia, after its introduction in America, were British, yet of recent years new drugs, new methods, and new knowledge in connexion with anæsthetics are rarely our native product. The history of anæsthesia is one on which every Englishman, as well as every Scotsman, can look back with pride. The names of Hickman, Simpson, and Snow are inscribed for all time on the list of pioneers in this beneficent branch of practical medicine. Naturally we cannot expect a constant stream of great or original investigators in this work more than in any other department of scientific work. It looks, however, as though for some reason or another research work at all is altogether lacking or extremely scanty in Great Britain. Intratracheal administration of anæsthetics comes from America and spinal anæsthesia from the Continent, and although it is true that probably in the use of these methods and certainly in the use of general anæsthesia our practice is on a higher general level than that of Continental countries or even of the United States, yet it is to them rather than to ourselves that belongs the credit of initiating the methods which we pursue. The reason for this anomaly is not obvious. It may be that the practical Briton has been more concerned to perfect the human applications of anæsthesia as it is presented to him than to seek alternative and superior modes in the laboratory, or it may be that this particular and very difficult line of inquiry has not appealed to research workers because of certain inherent fallacies in the application of experimental results in anæsthesia to the human subject. Whatever the reason it is a pity that experimental research in anæsthesia should fall behind clinical excellence in this country. In some respects anæsthesia even at its best is still crude. Who, for example, can guarantee freedom from after-sickness in a formidable proportion of cases? Who, indeed, can tell the true pathology of this condition or supply anything but empirical remedies? Certainly improved technique has made this trouble less formidable than it used to be, but it is still one to be reckoned with, and supplies—even if there were no others—a first-rate problem for solution by research work in anæsthetics. We trust that the response to the appeal may prove sufficient to found a Hickman medal for original work.

THE OPHTHALMOLOGICAL SOCIETY'S CONGRESS.

DURING the last three days of this week the annual Congress of the Ophthalmological Society of the United Kingdom is being held in London, and there is every indication of a successful gathering. The subjects of the two principal discussions, on Thursday and Friday respectively, are Heterophoria and the Diagnosis and Treatment of Ocular Tuberculosis, the openers of the first being Mr. E. E. Maddox, Mr. Charles Goulden, and Group-Captain E. C. Clements, and of the second Sir Arnold Lawson, Dr. R. A. Young, and Mr. S. H. Browning. The morning of each day is being devoted to communications by individual members of the Congress, whilst for Friday afternoon, from 2.30 to 5, a clinical meeting has been arranged at the new Royal Westminster Ophthalmic Hospital in Broad-street, Holborn. By courtesy of Sir Joseph Petavel, F.R.S., the director, a visit is to be paid on Saturday afternoon to the National Physical Laboratory at Teddington.

Dr. T. Izod Bennett has been appointed Dean of the Middlesex Hospital Medical School in succession to Mr. Eric Pearce Gould.

Mrs. Margaret McGregor, of Stirling, has left £20,000 to the University of Glasgow to establish a chair in connexion with medical research.

PRINCESS MARY AT BRADFORD.—On Thursday in last week Princess Mary opened two infants' wards, a sunlight department, and a nurses' home at the Bradford Children's Hospital.

ANCOATS HOSPITAL, MANCHESTER.—The report of the medical board of this institution for 1928–29, submitted by the chairman, Mr. Arnold Renshaw, contains a summary of the extension of the methods of investigation to which many special types of disease are to-day submitted, and Mr. Renshaw indicated that during the next decade the special departments of Ancoats will require increased equipment to keep pace with modern knowledge and technique, laboratory work in particular having considerably increased in extent and application. In view of the extension of the municipal health services, and of the municipalities taking over the present poor-law hospitals, a greater onus, he points out, will be placed upon the voluntary hospitals to devote themselves to more specialised and serious disease, if by the force of an individual enthusiasm and zest for advancement and research they are to lead the van of medical progress. "The problem of the future," runs the report, "is how to apply these highly developed, precise scientific methods of individual diagnosis and treatment to patients in the mass without losing the thread of continuity of observation in any one patient." The solution of the problem is found to lie in finance, ample equipment and space, careful organisation, expert supervision, and enthusiasm.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XXVII.

THE SIGNIFICANCE OF ORGANISMS IN THE URINE.

I.—PRELIMINARY TESTS FOR INFECTION.*

THE presence of organisms in the urine is direct evidence of an infection of some part of the urinary tract, provided that the specimen has been taken with due precautions against contamination from external sources including the urethral meatus and the surrounding parts. A cellular reaction almost invariably accompanies bacterial infection. No bacteriological examination of urine is therefore complete unless the cellular content is also investigated. Where possible, both cellular and bacterial content should be estimated quantitatively, otherwise no proper judgment can be given as to the significance of small numbers of cells or organisms. Furthermore, the analysis of the various types of cells present, and a search for casts and crystals, often furnish valuable help in locating the exact site of an infection.

Organisms and Cells in Small Numbers.

The presence in small numbers either of organisms or of cells does not necessarily indicate a pathological state. Quite commonly, a few meatal organisms, usually *Staphylococcus albus* or diphtheroid bacilli, find their way into a specimen during the passage of a catheter and yield a growth on culture; again, first morning catheter specimens from apparently normal individuals frequently contain a few leucocytes. The clinical history together with experience in the quantitative evaluation of such findings will usually decide whether they signify infection or pyuria.

Apart from meatal contamination, a point frequently raised is whether the finding of one or two definitely pathogenic bacteria in a catheter specimen of urine may not be due to a power possessed by the kidney of removing organisms from the blood stream —a question most often asked in regard to tubercle bacilli. It is now generally believed that a healthy kidney will not pass micro-organisms; that the presence of tubercle bacilli in the urine (excluding tuberculosis of the urinary tract below the kidney) implies a tuberculous lesion of the kidney; that in typhoid fever, septicæmia, or scarlet fever, whenever the causative organism is found in the urine, there must be a renal lesion which allows the organism to pass the kidney even though the lesion may be too small to produce renal symptoms.

Infection in the urinary tract may involve the kidney substance, the renal pelvis, the ureter, the bladder, or the urethra and its ducts. A positive bacteriological examination should assist in pinning down the infection to one or more of these sites if the organisms having a predilection for the various sites are known and if the bacteriological and clinical findings are correlated. From the practitioner the bacteriologist will require a properly collected specimen and a reasonable history of the case. The history, so often withheld, is of great importance in that it enables the bacteriologist to select the most suitable medium for obtaining successful cultures.

Collection of the Specimen.

A catheter specimen affords the only reliable positive information as to bacterial content, except when the urine is to serve simply as an index of urethral infection. Admittedly, it is not always desirable to use a catheter in practice, and it is a reasonable argument that if an ordinary specimen contains no organisms then a catheter specimen certainly will not. The preliminary examination of a "cleaned up mid-stream" specimen is therefore a useful procedure and, if negative, is entirely reliable; but if such a specimen contains organisms, catheterisation must be performed unless the bacteria can, with certainty, be classed as contaminants.

Catheter specimens should be received into a sterile flask or glass-stoppered bottle and should be examined as soon as possible after collection. If there is undue delay delicate organisms such as streptococci tend to die out, pus is liable to disintegrate and disappear, whilst, in hot weather, coliform organisms may so multiply that the number present gives a false idea of the severity of the infection. In all cases the first morning specimen supplies most information, and it is the only specimen of any value for quantitative and comparative work.

Males.—Non-catheter specimens from the male must of necessity contain the washings from the urethra; even a mid-stream specimen will contain prostatic or urethral pus and bacteria if infection in these sites is heavy. "Cleaned-up mid-stream" specimens are, however, relatively satisfactory as an index of infection of the bladder and higher parts of the urinary tract. When collecting a mid-stream specimen the urethral meatus should be washed, the first 20 c.cm. of urine passed into any vessel, and the remainder of the bladder contents passed straight into a sterile container.

Catheters are essential for obtaining representative bladder specimens if there has been antecedent gonorrhœa or prostatitis, and it is advisable to use a catheter in all males over the age of 50, owing to the frequency of mild chronic *B. coli* infections of the prostate. When examining for tubercle bacilli the specimen should always be taken with a catheter.

Females.—The cleaning up for bacteriological purposes of the external genitals of the female is difficult, and it is still more difficult to ensure that the urine is not contaminated with the numerous and varied vaginal and vestibular bacteria. Pus, epithelium, blood and mucus, all derived from the genital passage, are frequently present in the urine, and very few ordinary specimens of female urine are sterile on cultivation. Practically no reliance can be placed on the presence of pus and bacteria as indicating infection of the female urinary tract unless the specimen has been obtained with a catheter.

Children and Infants.—It is possible to catheterise even the smallest infant, but the procedure is not desirable when it can be avoided. Examination of a cleaned up specimen should always precede the passing of a catheter. Infants frequently pass water soon after they begin to feed. With patience a reasonable specimen of urine, uncontaminated with fæces, can be caught in a clean chamber if the infant is supported on the vessel held between the knees of the mother or nurse.

Ureteric Specimens.—When bacterial infection has been definitely located to the kidney it is frequently necessary to determine whether one or both kidneys are involved. This is particularly so in the case of tuberculosis. Ureteric specimens are best obtained with ureteric catheters passed by direct vision through a cystoscope—an operation requiring considerable practice and skill if injury to the ureter is to be avoided.

The Results of Preliminary Examination.

Examination of the urine for evidence of pyelitis is well worth while in all cases of fever of unknown origin, particularly in children, and in all cases of abdominal pain in which the diagnosis is at all obscure. The practitioner himself can rarely afford the time to do more than simple chemical tests for pus and blood, and examinations of the centrifugalised deposit or the deposit on standing.

The presence of pus in the urine can only be established with certainty by microscopical examination. Other methods, such as the caustic potash test or the ozonic ether test, only give positive results when much pus is present and they are in no way specific. Similarly, the guaiacum test for blood is extremely insensitive when compared with detection by the microscope. A simple microscope with a 1/4 in. and 1/6 in. objective is all that is needed in the majority of cases for obtaining evidence of bacterial infection, though a determination of the nature of the infection usually requires more elaborate apparatus and a more lengthy procedure.

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* The significance of the type of organism present will be discussed next week.

Macroscopic Appearances.—Urine containing a large quantity of pus and bacteria has, when first passed, a characteristic sheen, whilst the turbid part rapidly settles to the bottom of the container in contrast to the slower deposition of amorphous phosphatic or uratic material. Though such an appearance is fairly characteristic the nature of the deposit should always be confirmed with the microscope.

Pus with Gonococci.—The macroscopic appearance of the urine is often used as a rough test of the state of the urethra and prostate in male gonococcal infections. For this purpose the urine is passed into two glasses, the first glass being an index of the condition of the anterior urethra, and the second glass that of the prostatic urethra. Obvious pus in the first suggests anterior urethritis, whilst "threads" or "commas" indicate that the prostate is involved. The procedure is sometimes elaborated by massaging the prostate before the urine is passed, so that the specimen contains prostatic secretion which can be concentrated with the centrifuge and examined for gonococci. This method yields less information than can be obtained from a stained smear of the prostatic secretion itself. It should always be borne in mind that pyuria in the male is not synonymous with gonococcal urethritis and that the continued presence of pus in the urine of a gonococcal patient merits investigation of the upper parts of the urinary tract.

Microscopic Appearances.

A drop of the urinary deposit is placed on a slide, covered with a slip and examined with the 1/4 in. and 1/6 in. objectives. A knowledge of sizes is of invaluable assistance in differentiating pus cells, epithelial cells, and red cells one from another or from foreign material such as droplets of oil derived from a catheter. Crystals and casts require more experience, but the commoner crystals, such as calcium oxalate or uric acid, and the general form of a cast can quite easily be recognised. Practitioners rarely find it an economical procedure to maintain a stock of bacteriological stains or a 1/12 in. oil immersion objective. When stained preparations are made, Gram's method with a suitable counterstain is the only reliable technique. Simple methylene-blue stained smears are useful as a guide, but in definite *B. coli* infections the bacilli can be seen with the 1/6 in. objective in an unstained preparation.

The practitioner, with his own microscope, can frequently find some evidence of urinary infection, though the exact nature of the infection usually requires a more elaborate investigation by a laboratory. Periodical examinations by the practitioner serve as a check on the progress of the more acute and definite infections, but it should be realised that any test, other than a cultural one, is almost valueless for estimating a cure.

LIONEL E. H. WHITBY, M.D. Camb.,
M.R.C.P. Lond.,
Bacteriologist to the Bland-Sutton Institute of Pathology,
The Middlesex Hospital.

SALISBURY INFIRMARY LEAGUE.—The income of this league last year exceeded £11,000, and two beds have been endowed at the infirmary. The desirability of establishing a similar league for the middle class is being considered by the council in consultation with a number of public bodies in Salisbury.

Special Articles.

THE EVOLUTION OF HOSPITAL SCHOOLS:

COMBINED TREATMENT AND EDUCATION FOR CHILDREN SUFFERING FROM PHYSICAL DEFECTS.*

BY SIR HENRY GAUVAIN, M.D., M.CHIR. CAMB., F.R.C.S. ENG.,
MEDICAL SUPERINTENDENT OF THE LORD MAYOR TRELOAR CRIPPLES' HOSPITALS AND OF THE MORLAND CLINICS, ALTON;

AND

EVELYN M. HOLMES, M.B. MANCH.,
RESIDENT MEDICAL OFFICER, MORLAND CLINICS, ALTON.

THIS paper is designed to call attention to a movement which has almost imperceptibly gathered force and momentum during the last 20 years, is still increasing rapidly, is changing and is still further destined to change the whole outlook and future of the physically defective child of the elementary school type. While familiar to some social workers, educationists, and others especially interested, its importance is as yet hardly appreciated or understood by the general public. It is especially desirable that it should be recognised by and secure the support and sympathy of the medical profession, as it is a matter which is primarily dependant on expert medical help and guidance.

While much of what follows refers to the crippled child, we would urge that the term physically defective in this connexion should not be confined to the cripple, but rather be extended to embrace all those children, other than the mentally defective, who show pathological deviations from the normal of such a degree as to make desirable special provision for combined medical and educational treatment, whether temporary or prolonged.

And here let us emphasise that the first and essential responsibility for the management of such children rests, not with the teacher but with the doctor. Children may be divided into two broad groups: those who are well and those who are not. For the latter, every endeavour should be made to achieve restoration to normal health whether the disability be of short duration or chronic in type. One would imagine such a statement to be self-evident. In acute illness it is accepted, but in chronic disability it is not. It is our purpose to direct attention to this matter, and we feel that prolonged experience in the management of the disabled child is not only a justification for a plea on his behalf, but also a responsibility which makes such a plea necessary.

The Chronically Disabled Child.

For the chronically disabled child of the working-class parent we shall proceed to show that almost nothing was done in the way of combined treatment and education until the present century; but during the last 30 years the outlook for such children has undergone revolutionary and beneficent changes. For other children, there is little advance to be recorded. For the secondary or public school child, on the other hand, there is no State aid, no guiding organisations, almost no specially staffed and organised institutions—no corporate life with its wider outlook, its spur to ambition, its competition, its scope for achievement and advance, its morale and discipline, its inviting threshold to active and useful adult life, with all its opportunities and responsibilities. The greatest bar to their progress is the inability through lack of knowledge of their parents to realise their children's potentialities and how they may best be catered for, and the lack of opportunity of obtaining the necessary help. The more severe cases are usually tenderly cared for in their own homes, shielded from those stimulating influences which should so improve their character and moral fibre, and denied the opportunity of exercising those gifts of aptitude and intelligence with which, as a rule, they are richly endowed. The less severe cases attend day schools perfunctorily or are drafted to so-called schools for delicate children. A few struggle through ordinary schools, but handicapped by afflictions which might often be remedied, do not get their full chance and, their sensitive natures exposed unhappily too often to the derision and scorn of their schoolmates, stand grave risk of being warped and soured. A schoolboy or girl may often unthinkingly be a little beast to his afflicted fellow. How many of us realise the sufferings of the unhappy victim of nocturnal enuresis in the ordinary school? And that is a comparatively trifling example. This is deplorable, as the potentialities of these afflicted children are immense, both to the community and to the individual. Their very defects may not infrequently in skilled hands be turned to advantage. A very real effort should be made on their behalf.

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* A paper read before the Medical Officers of Schools Association on March 15th.

Historical Survey.

One of the most profound changes which has taken place in English elementary education during the last 20 years has been the direct attention given to the physical condition of the child. It has gradually been realised by school authorities that each child must be dealt with as a growing individual whose mental capacity and development is dependent on his health and physical fitness. Taking first and chiefly the cripped child, throughout history his has been an unhappy lot. The Spartans with eugenic motives took their cripples to the hill tops and killed them.[1] The Athenians allowed theirs to die from cold and neglect.[2] Similar treatment has been common amongst many savage races with less justification. In mediaeval times in our own country the cripple was coupled in men's minds with malignity. It was assumed that the crippled in body were crippled in mind too; and they must often have become so as a result of the attitude of others to them. As Sir Robert Jones has said:

> "Just as the mediaeval witch became obsessed by the enshrined belief in her own devilment, so the cripple, taunted, shunned and persecuted, found refuge in a mind as distorted as his body. This perversion of character, as familiar in Shakespeare's 'Richard III.,' as in Dicken's 'Quilp,' or Hugo's 'Hunchback of Notre Dame,' presents the bitter revolt of men in exile and contempt."

Where such ideas did not predominate, the attitude was one of ridicule. The hunchback was chosen to be the jester of the court. With the Reformation crippling deformity was considered emblematic of heavenly wrath, and the cripple was cast more completely than ever from the pale of society. Nevertheless, in innumerable instances throughout history cripples, in spite of their physcial disabilities, have achieved distinction and exercised important influence.

The first legislative provision for cripples which we can trace was in 1601 when custody only for cripples was allowed by the Poor Relief Act. When attention was being drawn generally to child welfare during the industrial revolution of the nineteenth century interest became rather more concentrated on the cripple. But he was then regarded as a mere object of pity. Charles Dickens aroused interest by depicting very truly the attitude of the public in his day to the cripple and the attitude of the cripple, perforce, to himself, with no thought or hope of cure; but a more or less cheery philosophy and acceptance of his inevitable fate. It was generally understood that if they survived, their deformities were likely to render them useless as citizens. Cases congregated in homes for incurables and workhouse infirmaries, or were hidden in the recesses of their own homes with no books, toys, or interests. Here and there a philanthropic worker would make some effort to give them help and add to the interest of their lives. An early pioneer was Lord Shaftesbury, who did so much to win the sympathy and help of the public for these unfortunate children.

In 1851 and 1865 two industrial homes were founded for older cripples which are still in existence. The one was the Cripples Home and Industrial School for Girls in Marylebone (now transferred to Winchmore Hill), and the other was the National Industrial Home for Cripple Boys at Kensington.

When the Education Act of 1870 made elementary education compulsory no cognisance was taken of children who by reason of mental or physical defect could not attend or profit by ordinary school. During the 10 years preceding the beginning of the twentieth century a few efforts were made by individuals to start little schools for some of these crippled children and the Board of Education, as an act of grace, allowed them to rank as infants schools for purposes of grant.[4]

The first real move for the cripple, however, was taken by Mrs. Humphrey Ward. She made use of the Passmore-Edwards Settlement off the Gray's Inn-road, which had existed as a play centre, and with the help of friends on the London School Board opened in 1899 a small school for 25 invalid and crippled children. This was the first day school for physically defective children to be supported out of public rates.

In 1893 the first step had been made in specific legislation for defective children by the Elementary Education (Blind and Deaf Children) Act enabling local education authorities to deal with children of this category in their area. Cripples were left out simply because it had never occurred to persons in authority that they merited consideration. Mrs. Humphrey Ward, with the support of the committee of the Passmore-Edwards Settlement and the newly gained interest of the London School Board, then urged the extension of this Act to include other defective children. The passing of the Elementary Education (Defective and Epileptic Children) Act of 1899 was a result of this, and for the first time gave statutory power to local authorities to deal with the education of the cripple child. Though permissive only, it gave them the power to make arrangements for ascertaining what children in their area were suffering from such physical defects as made them incapable of receiving proper benefit from instruction in the ordinary elementary school, and for providing for the education of such children. The first day school for cripples, to be certified under this Act, was this Passmore-Edwards Settlement School, which was certified in 1900. The first residential cripple school to receive official recognition was the Heritage School of Arts and Crafts, Chailey, Sussex, founded and conducted by Mrs. Kimmins. In 1905 the Manchester Education Committee established the first municipal residential school for physically defective children at Swinton House.

Such developments are of special interest when one recollects that it was not until 1907, by the Education (Administrative Provisions) Act, that the School Medical Service was inaugurated. This is the most important landmark in legislative attempts to improve the lot of the physically defective child. Under the wise, statesmanlike, and sympathetic guidance of Sir George Newman an entirely new era was opened for the defective child, and while much still remains to be done, almost incredible advances have been made with incalculable benefits both to the individual and the community.

No immediate measures followed this Act. For financial reasons local authorities were encouraged rather to coöperate with voluntary agencies than seek assistance from the Board of Education on behalf of the debilitated crippled children in their areas.[5] But all the time public sympathy was being further enlisted and public opinion educated to the needs of the debilitated and crippled child.

The Experiment at Alton.

In September, 1908, the Lord Mayor Treloar Hospital and College was opened in the derelict Princess Louise Military Hospital at Alton. Sir

William Treloar was a philanthropic but shrewd man of business. Inspired by Charles Dickens' "Christmas Carol" to help cripple children, he had inaugurated some years previously a crippled children's Christmas Hamper Fund. He soon realised what a small proportion of the physically defective children of the metropolis were receiving adequate medical attention. Country hospitals for such patients were unknown. No institution existed which combined expert medical aid, education, and technical training. Treatment in the few cripples' homes was either non-existent or so notoriously bad that the term cripples' home was associated with pity and contempt. Orthopædists had not even considered the wider and essential issues of combining with adequate treatment, education, and technical instruction. Philanthropists who were interested in cripples took for granted that surgical skill could do so little that provision for specialised treatment was hardly called for, and the cripples' home was a mere asylum for sheltering the unfortunate recipient of its charity.

The scheme originated by the late Sir William Treloar is still the most perfectly adapted to the full needs of the cripple child with which we are acquainted. Briefly, it comprises the treatment of the cripple by the most modern orthopædic methods with preference to conservative treatment in surgical tuberculosis, in an open-air country hospital situated in a specially suitable locality. In addition to specialised methods of local treatment the importance of rest, exercise, open-air, and sunlight has been recognised and utilised to the full from its inception. To these have been added artificial light treatment since 1912 and sea-bathing for therapeutic purposes since the establishment of its seaside branch at Hayling Island immediately after the late war. During treatment, and since the foundation of the hospital, children have received education, and this without grant from the education authorities for the first five years of its existence. From its inception there has been practised a carefully planned system of after-care designed on the broadest medical and social lines.

For the adolescent cripple, for whom further surgical aid could not be given, technical training combined with specialised education in a separate institution, but under the same management, has been employed from the outset. Boys admitted to this department of the hospital's activities—the College—receive training for three years in a trade suited to their limitations. On completing their training they are assisted to find permanent employment. By means of an old boys' association contact with them is maintained after discharge and they are helped and encouraged by every possible means and assisted to fresh employment if and when required.

After the passing of the Act of 1907 progress became more rapid. By the Finance Act of 1911 £1,500,000 was put aside for sanatorium work and the like, both children and adults benefiting.[6] In 1912 further grants were given. In the same year pulmonary tuberculosis became notifiable and this helped to diminish infection and trace more easily cases of surgical tuberculosis. Meanwhile 92 day and residential schools for the education only of cripple children had been established accommodating 4617 children and certified as "special schools" by the Board of Education. Fifty-five of these were receiving an annual grant from the Board.[7]

It had been realised already that prolonged treatment was advisable in special sanatoriums under constant expert medical supervision for children with acute tuberculous infections of the bones and joints and that stay in sanatoriums was advisable until complete arrest of the disease had been secured, a period often of 18 months to two years, or even longer. Yet not in one case in special school or in hospital had education and treatment coexisted officially. The Lord Mayor Treloar Hospital, however, at Alton, had, as already stated, on its own responsibility and from its inception in 1908, been offering educational facilities to its patients.

Under the Elementary Education (Defective and Epileptic Children) Act of 1899 the hospital was certified as a "special school" for 40 life-children in May, 1913, when two qualified teachers were appointed. These teachers took charge of the convalescent children who were taught in the school-room or the forest school. The Chief Medical Officer in his report to the Board of Education for 1912, having sketched the above, continued as follows:

> "The medical superintendent and the trustees, however, were desirous that the arrangements for teaching should be extended so as to provide for children who were still confined to bed. In view of the special circumstances, and in order to overcome the difficulty of introducing effective ward-teaching into an institution which is primarily a hospital and not a school, the Board agreed to sanction an experimental scheme. Under this scheme the school was to be certified for 150 children and the staff to consist of four fully qualified teachers."[8]

And the report concluded with a remark on the difficulty of grafting such an educational scheme on to existing hospital arrangements, as if it was very conscious it was venturing on untrodden ground, and emphasised the necessity of sympathetic coöperation and give and take between the nursing and teaching staffs. This, then, was the first "hospital school," the first recognised attempt to cure and educate the cripple at one and the same time.

Lord Melchett, then Sir Alfred Mond, Minister of Health, speaking at Alton in 1922, referred to this as follows:

> "Sir George Newman had just reminded him that when the Prime Minister visited the (Treloar) hospital in 1911 he was so struck by the important work being done there that he then and there decided to start the giving of grants to make it possible for the work done there to be extended throughout the country. The hospital was a great monument and was a milestone on the road leading to the increased *care and welfare of children.*"[9]

Changing Outlook for the Cripple.

The importance of this official recognition and approval will be readily realised. Other hospitals soon followed and within a year Heswell, Woodlands (Birmingham), and Leasowe (Cheshire) were also approved by the Board for purposes of grant. Gradually but surely the outlook of the cripple, notably the tuberculous cripple, was changing. But with the general public, even among educated people, crippledom was still considered a condition which did not merit much attention, it not having been realised that the cripple could be of any appreciable economic value to the nation. Where the local authorities had attended to the education of the crippled child in their area this was in the vast majority of cases arranged for in schools for the mentally defective. This is so even now in some areas. The blind, the deaf, the epileptic, and the mentally deficient were earlier and better catered for than the cripple. Indeed, when in 1914 the *Amended Elementary Education (Defective and Epileptic Children)* Act was passed putting a duty on the local educational authority to make suitable provision for the education of mentally defective children over 7 years of age, no thought was taken of the cripple child for whom as yet no compulsory measure had been passed by Parliament.

Then came the war with its inevitable toll of crippling among the adult male population. In the words of Sir William de Courcy Wheeler:

> "The success which followed the stupendous effort of the medical profession and its allies to restore maimed and crippled soldiers to a normal condition of useful citizenship awakened Britain and America and most of the civilised world to the fact that crippledom amongst the civil population was an unnecessary and avoidable evil."[10]

At the same time "returns" from cripple schools were showing that 70 to 90 per cent. were being discharged fit to compete in the ordinary industrial life of the nation. The cripple, hitherto a menace to society, was being proved capable of taking his own stand in the world. In other words, his combined treatment and education were worth while. The

London Education Committee Return for Cripple Schools in 1917 states that :—

Concerning 1609 children leaving 36 certified day schools in the three years ending March 31st, 1918 :—

Passed out below 14 as physically fit to attend ordinary public elementary schools	345
Exempt at 14 as being no longer physically defective ..	94
Exempt between 14 and 16 for suitable work	768
Left school at 16 because of age limit (of these 70 per cent. fit for suitable work)	366
Obtained scholarships in various technical and commercial schools	36
	1609

In 1918 the Amended Elementary Education (Defective and Epileptic Children) Act of 1914, already alluded to, was extended to include the physically defective. It required the local authority to ascertain what children in their area were physically defective or epileptic and to make provision for their education as per Section 20 of the Fisher Education Act. Actually this section of the Act did not come into operation until 1926 and even now is not strictly enforced.

Meanwhile, however, from various reports it soon appeared that ½ to 1 per cent. of children of school age were requiring treatment and education as cripples —i.e., 30,000 to 60,000.[12] Investigations into the causation of crippling defects in school-children brought out a number of interesting points. Diseases of bones and joints (mostly tuberculous), infantile and other forms of paralysis, congenital defects, rickets, and accidents were chiefly responsible. Rheumatism rarely produces joint disease and crippling amongst children, though amongst adults the toll is high. Tuberculosis headed the list as an individual cause in children, and in order of frequency spine, hip, knee, and ankle. Poliomyelitis followed closely.[13] It is noteworthy that the age of onset for all types of crippling falls predominately in the years preceding ordinary school life; for the majority of cases of tuberculosis arise between the ages of 1 and 6, and of poliomyelitis the same, while rickets is essentially a disease of the first year or so, and congenital defects must also be included. As these figures of the early onset of crippling deformities were brought to light and as many years of medical inspection showed that a proportion of 30 to 40 per cent. of children on entering school at the age of 5 require medical treatment for various causes,[14] largely a result of neglect, new regulations were passed under the Education Acts of 1920 empowering local authorities to provide educative treatment and therefore medical supervision from the age of 2 upwards.

The importance of the physical, social, and general welfare of children of pre-school age had long been realised. Nursery schools for such children had been inaugurated by voluntary enterprise some years previously, and by the Education Act of 1918 their establishment and promotion had been officially recognised and grants provided in their aid. This later work on the age of incidence and causation of physical disability gave fresh impetus to the movement on their behalf, and an earnest attempt was made to correlate for them the work of the various health, educational, and general welfare organisations. By 1926 there were 99 day nurseries for 3354 children and 26 residential nursery schools with accommodation for 1367, but the greater number of these were still dependent on voluntary committees.[15]

These schools by overcoming the effects of the too-frequently insanitary and mentally and physically unhealthy environment of the homes from which many of the children come; by encouraging the natural unrestricted development of the children's mental and physical resources, whilst instilling appreciation of the principles of healthy living, of fresh air, wholesome food, and regular hours; and by the additional benefit gained by the modicum of discipline and education given, have proved indisputably their very great value and their promise.

At the same time as this legislation was being extended to provide for the older child with physical debility, as already stated, technical training for the adolescent cripple had been commenced as early as 1851, and such training combined with treatment was started at the Treloar College in 1908. These efforts were recognised officially in 1911 but the legislation was now further extended, giving opportunity for comprehensive schemes for vocational training on various lines with substantial provision of grants.†

Incidence of disability as it occurs amongst elementary school-children is well shown by Dr. (now Sir William) Hamer's report on this in the London area in 1919 as follows:[16]

Pulmonary tuberculosis	1,614
Surgical tuberculosis	3,507
Other crippling defects	5,407
Heart crippling	2,291
Delicate or otherwise unsuitable for ordinary school ..	17,228

To the Chief Medical Officer of the Board of Education it appears that the child who is in a chronic state of subnormal health now constitutes one of the most serious problems of the School Medical Service.[17]

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12. Report of Chief Med. Off. Bd. of Educ., 1919, par. 145.
13. Ibid., pars. 146, 147.
14. Health of the School Child, 1923, p. 82.
15. Health of the School Child, 1926, p. 38.
16. Report of Chief Med. Off., Bd. of Educ., 1919, par. 157.
17. Health of the School Child, 1926.

(To be concluded.)

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Aberdeen Joint Hospital Fund.

THE Aberdeen Joint Hospital Fund of £400,000 is now closed. This is not only a personal triumph for Lord Provost Lewis, but a great achievement for the north-eastern region of Scotland. It has taken only two years to raise this sum. In the last month Lord Provost Lewis called for £30,000—that is, £1000 a day —and he got it! He has done even better, for he took up a friendly bet of £5000 that he would not get his last £30,000 in a month. The bet has been handsomely paid and this £5000 has been added to the £400,000. With this and certain other subscriptions there is now some £7000 more than the total asked for. The story of this fund is a romance of generosity. Lady Cowdray began it two years ago with £25,000; Viscount Cowdray gave another £25,000, and two similar gifts from Sir Thomas Jaffrey and Sir Robert Williams completed the first £100,000, but there have been shoals of small subscriptions and the whole north-east of Scotland was roused to a great effort. Of the total, it is expected that £107,000 will go to endowment.

The whole scheme is now safe, and Aberdeen now leads Scotland on two issues—by the coördination of its public medical services and by the splendid impulse given to the voluntary hospital movement.

Scarlet Fever Antitoxin.

Dr. C. Barclay Reekie, medical officer of health for Dunfermline and medical superintendent of West Fife Joint Hospital, records his experience in a considerable epidemic of scarlet fever, where the overcrowding of the hospital during the winter months had been considerable. He states that they emerged without one fatal case, and attributes this largely to the use of scarlet fever antitoxin. "Its routine use," he is reported as saying, "had undoubtedly diminished the average length of stay of scarlet fever patients in hospital, and on many occasions during intensive overcrowding it was only its employment that made the admission of fresh cases at all possible. At first it had been thought that the expense of using antitoxin might not be justified, in view of the fact that scarlet fever did not endanger life to the same extent as did diphtheria; but experience had made it quite clear that they had an invaluable remedy, which, if used early in the disease, would prevent complications and greatly shorten the period of disability. The duration of residence now attained was the lowest on record, and there was no doubt that a saving had been effected in the cost of board of patients which more than covered the additional expense entailed. Furthermore, there had been a reduction in permanent disability resulting from complications of the disease." The experience in Scotland was summarised in the Board of Health annual report for 1927, and Dr. Reekie's clinical data are in line with observations elsewhere. But scarlet fever immunity is not a simple problem and it is too early to formulate definite conclusions. This experiment, however, in a small provincial hospital, is an indication of how rapidly the new ideas in public health are being applied practically. Over 30 years ago clinical experiment had begun with diphtheria antitoxin; but diphtheria is still with us in somewhat larger numbers than before, and the conquest of scarlet fever is not likely to be more rapid.

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† For detailed report see Education Act, 1921, Part V., Grant Regulations, No. 19, and the 1925 extension to this Act, the so-called "Board of Education (Special Services) Regulations."

Influenza Vaccine: An Edinburgh Experiment.

This year Lieut.-Colonel W. Glen Liston, at the laboratory of the Royal College of Physicians of Edinburgh, has had the opportunity of testing the effects of influenza vaccines. The results, though important as far as they go, are not conclusive, and Colonel Liston does not regard them as more than the beginning of an investigation. In the recent epidemic 700 Edinburgh people were inoculated with a vaccine prepared almost on the lines of the vaccine recommended by the Government in 1918. The chief difference was that it contained more of the influenza bacillus than the 1918 vaccine. Its object was to vaccinate persons against both influenza and its complications. Colonel Liston had to depend on volunteers. In some cases whole staffs submitted to vaccination, but in other cases only a few. As the epidemic was in progress no time was allowed for the vaccine to produce immunity before exposure. As a preventive measure, therefore, the experiment had little chance of succeeding. But those vaccinated, and afterwards contracting influenza, seem to have suffered far less severely than the unvaccinated.

The results obtained in the case of the scavenging staff of Edinburgh Town Council, which are tabulated below, bear this out:—

	Vaccinated.	Not vaccinated.
Total of outdoor staff, 990 ..	139	851
Off work with influenza	13	78
Total number of days off	136	1096
Average days off per man	10·46	14·05
Percentage attacked	9·35	9·16

The important points to bear in mind are that in the case of the unvaccinated the period of sickness was longer, and that influenza attacked both classes in practically the same proportion.

The figures in this table are supported by figures obtained in connexion with a business house in the city. Of its staff 51 were vaccinated and 140 were not vaccinated. Out of the 140, 9 had influenza; out of the 51, 5. But while the attack lasted many days in the case of the former, it lasted but two days in the case of the latter.

Correspondence.

"Audi alteram partem."

PUBLIC HEALTH CONGRESS IN ZURICH.

To the Editor of THE LANCET.

SIR,—The preliminary programme for the 1929 Zurich Conference of the Royal Institute of Public Health, May 15th–May 20th, has now been issued and a copy can be forwarded on request. We are assured of the most cordial welcome by the Swiss National Government, the authorities of the Canton, City, and the University of Zurich, and by the leaders of the medical school of Zurich.

Invitations have also been received to visit various health stations in Switzerland. The Government gives a concession of 50 per cent. on the State Railway; free transportation will be provided on the Rhaetian Railway, Chur to Davos, and on the railways, Chur to Arosa, Sierre to Montana, and Aigle to Leysin. The local authorities at each of these well-known centres are most anxious to welcome as many members of the Congress as possible. We are further assured by the Czecho-Slovak Minister, Mr. Jan Masaryk, of a hospitable reception for those who may find time after the Congress to extend their journey to the two great Czecho-Slovak spas of Carlsbad and Marienbad.

In order to complete arrangements for the comfort of members of the Congress desiring to participate in the extensions it is essential that we should know immediately which of the visits members will desire to take. Particulars regarding the extensions and the routes to be traversed, together with information as to the expenses to members of the Congress, will be forwarded on application; non-members may accompany members, but will not be able to enjoy all the special privileges. The inclusive cost of the visit to the Congress at Zurich will range from £10 4*s.* 6*d.* for the short sea route, second-class travel on the Continent and hotel accommodation, to £12 12*s.* 6*d.* for first-class travel throughout and hotel accommodation.

Full particulars regarding the different extended journeys available after the Conference, together with a list of the various hotels in Zurich, is available on demand, and it is earnestly desired that all who propose to attend the Conference will communicate with us as soon as possible.

We are, Sir, yours faithfully,
E. W. HOPE, O.B.E., M.D., B.Sc.,
T. N. KELYNACK, M.D., M.R.C.P., J.P.,
Hon. Secretaries.

Royal Institute of Public Health,
37, Russell-square, London, W.C.,
April 3rd, 1929.

THE EMPLOYMENT OF BACTERIA IN MODERN WARFARE.

To the Editor of THE LANCET.

SIR,—Profs. Pfeiffer and Prausnitz are men of great scientific distinction who may be presumed to be competent to listen dispassionately to evidence, to examine it critically, and to give a true verdict. I ask them to bend their minds to this simple problem:—

In January, 1918, a laboratory attached to our 5th Army reported the isolation of bacteria, resembling bacilli of plague, from material dropped by a German balloon. This discovery is officially confirmed in our "History of the Great War." From this I quoted textually in my speech, and was therefore "sure of my facts."

No evidence to refute the official statement has ever been produced. There have been, it is true, vehement though vacuous denials by interested persons acting perhaps under instruction; but there is not one shred of evidence which has ever impugned the accuracy of our laboratory investigation. I therefore assume that my eminent colleagues must conclude, however reluctantly, that this discovery of bacilli is not open to doubt. I next assume that the hypothesis of spontaneous generation of bacilli has been abandoned. I venture, therefore, to summarise: the bacilli were found; they did not arise spontaneously; they must have been introduced into the material in which they were discovered; no one had access to this material before it was dropped in our lines, but units of the German Army.

Accordingly, I invite Profs. Pfeiffer and Prausnitz to rid themselves of prejudice, and after considering this evidence to join with all dispassionate people in passing a verdict of Guilty against the German Army upon the odious charge of employing bacteria as instruments of war.

I am, Sir, yours faithfully,
MOYNIHAN.
Portland-place, W., April 5th, 1929.

GALLOP RHYTHM.

To the Editor of THE LANCET.

SIR,—In the course of the interesting annotation on this subject that appeared in THE LANCET last week (p. 729) two types of gallop rhythm are said to have been described, whereof the one depends upon apparent reduplication of the first, and the other of the second cardiac sound. This is true, but the description perpetuates confusion.

In the *bruit de galop*, described by Potain, the first sound appears to be reduplicated and, whatever the explanation and significance, the rhythm is that of a galloping horse's hoof-beats: two sounds in rapid sequence, and a third after a definite interval. Only this sequence, which is that of a gallop, should be called galloping. What is wrongly spoken of as galloping rhythm, due to apparent reduplication of the second sound of the heart, is not a galloping rhythm at all, but that which C. J. B. Williams, 90 years ago, rightly called cantering rhythm, for the rhythm is that of a cantering horse's hoof-beats; one sound, an interval, and then two sounds in rapid succession. This sequence gives what the French rightly call the *bruit de rappel*. It recalls the heavy blow of a smith's hammer on the object being forged, followed by two shock-absorbing taps on the anvil.

Thus, apparent reduplication of the first sound is galloping rhythm, *bruit de galop* or (frequently) Potain's murmur. Apparent reduplication of the second sound may be called *bruit de rappel*, or cantering rhythm, but should never be called "gallop rhythm" for the best of all reasons—that it does not resemble the rhythm of a galloping horse's hoof-beats. The whole matter is admirably set out in a little book now insufficiently read—namely, Gee's Auscultation and Percussion.

I am, Sir, yours faithfully,
F. G. CROOKSHANK.
Wimpole-street, W., April 5th, 1929.

BLOOD STANDARDS.

To the Editor of THE LANCET.

SIR,—The inaccuracies in the ordinary blood count are well demonstrated by Dr. Dyke in your issue of March 30th (p. 681), and all pathologists will support him in requiring from instrument-makers a statement of what they mean by normal. The matter could well be carried further and a definite arbitrary normal agreed upon for all instruments.

The Haldane hæmoglobinometer is probably the most accurate in its method of comparing a sample with the standard scale, but unfortunately the latter is set far too high. In my experience the normal with this instrument ranges from about 78 to 85 per cent. and a reading of 100 per cent. is almost unknown. It is evident that a true reading can only be obtained by adding 20 per cent. to the Haldane figure. I believe this excessive standard to be chiefly responsible for the statement that the colour-index in pernicious anæmia is frequently below one and is of small value in diagnosis. The Tallqvist method is not as finely graduated as the Haldane, but I find that it gives a more reliable estimation because its standard is set nearer to what experience indicates to be the true normal.

The colour-index as at present rendered is of little value by itself. Thus an index of 1·1 in a red cell count of five millions indicates that the red cells are more or less normal, but the same index in count of two millions denotes serious derangement. I therefore suggest that the index be followed by the letter E (for erythrocytes) and a digit representing the nearest million of red cells in the count. In this way the first example would read 1·1(E5) and the second 1·1(E2), thereby giving a definite significance to the index.

I trust that the matter that Dr. Dyke has raised will not be allowed to drop, but that concerted action will be taken.

I am, Sir, yours faithfully,
C. E. JENKINS.
Pathological Department, Salford Royal Hospital,
April 5th, 1929.

HICKMAN MEMORIAL FUND.

To the Editor of THE LANCET.

SIR,—A committee meeting of the Hickman Memorial Fund was held on March 27th, at which Lord Dawson presided. The possibility of fulfilling all the objectives of the appeal was fully discussed. It was decided that the Fund was, as yet, inadequate to restore Hickman's tombstone, to provide a memorial tablet for Bromfield Parish Church, to present a portrait to the Royal Society of Medicine, and to found a Hickman medal for original work of merit in anæsthesia. Subscriptions already received will be sufficient to deal with the three former, but not for the medal. In no better way can the object of this appeal succeed, both in honouring Hickman's name and in serving a useful purpose, than by stimulating research for new anæsthetics and methods, in which it must be admitted British anæsthetists have for some decades rather followed than initiated. The appeal will therefore not be closed for the present in the hope that some who have forgotten or overlooked the matter, or have not appreciated its practical as well as historical importance, and others who may feel that they are indebted to anæsthesia may yet give it their support. A list of subscribers will be published when the Fund is closed; Mr. V. Warren Low, F.R.C.S., 76, Harley-street, W. 1, is the hon. treasurer.—I am, Sir, yours faithfully,

CECIL HUGHES,
Hon. Sec.
London, W., April 3rd, 1929.

ACTIVE IMMUNISATION AND DIPHTHERIA.

To the Editor of THE LANCET.

SIR,—I was sorry and surprised to read in the paper by Surg.-Captain P. M. May and Prof. S. F. Dudley on this subject, published in your issue of March 30th (p. 656), that its two distinguished authors decided not to recognise as diphtheria the cases of the two boys, "the appearance of whose throats suggested a diagnosis of diphtheria," and from whose throats virulent diphtheria bacilli were isolated. Suppose these cases had occurred in a group of non-immunised boys, would they then have regarded them as only diphtheria carriers suffering from some other bacterial infection?

Other observers, such as those quoted by the writers, have recognised cases exactly similar to the two referred to above as cases of diphtheria; and in my opinion your two contributors are setting a bad precedent. I venture to say that the slightest attempt to gloss over a failure, however slight, will lead only to the discredit of the practice of immunisation which they are advocating.

I am, Sir, yours faithfully,
E. W. GOODALL.
Hemingford Abbots, Hunts, April 7th, 1929.

AN OVERDOSE OF THALLIUM ACETATE.

CONFLICTING REPORTS.

To the Editor of THE LANCET.

SIR,—It is interesting to note the conflicting reports regarding dosage and the metric system in this evening's papers when dealing with the thallium acetate case.

The *Star* says: "The strength of the solution, went on Dr. Scovell, was supposed to be 7·8 milligrammes to a drachm of body-weight."

The Evening News says: "Miss Tedham said there were 15·4 milligrammes in a gramme."

The *Evening Standard* says incidentally: "... That was based on the rate of 8·5 milligrammes per kilo body-weight," which may be correct.

I am, Sir, yours faithfully,
P. M. KEANE,
London, April 8th, 1929. Squadron-Leader, R.A.F.M.S.

⁂ A report of the inquest by our medico-legal *correspondent follows.*—ED. L.

MEDICINE AND THE LAW.

Overdose of Thallium Acetate: An Error in Calculation.

Dr. Cohen, the Wembley coroner, concluded on April 8th an inquiry into the death of three boys who *had been treated for ringworm at St. John's Hospital* for Diseases of the Skin, Leicester-square. The mother of the three boys described how they had each been given a draught in her presence at the hospital and how they had complained of pains later in the evening and next day and had died at different dates, which she gave. The hospital sister had told her that the medicine might cause the boys to complain of rheumatic pains; for this reason she had not called in a doctor immediately on their complaining of pain. Dr. Spencer Scovell, clinical assistant at St. John's Hospital, gave evidence that the drug used was thallium acetate, a recognised treatment for ringworm, the amount of the drug being based upon the weight of the child. The children had been weighed and the correct dose had been administered, assuming that the solution was of the strength she expected it to be. Asked by the coroner what was the lethal dose, she replied that a man was believed to have died, or very nearly died, *after drinking about a gramme of it.* The three boys should respectively have had 0·25, 0·23, and 0·18 gramme; that calculation was based on the rate of 8·5 milligrammes per kilo of body-weight. The drug was not dangerous if given in correct doses. Dr. R. M. Bronte and Dr. Roche Lynch gave evidence indicating that death was due to thallium acetate poisoning. Dr. Lynch said the bottle contained 5·6 times the quantity that was on the label. The hospital dispenser, a registered chemist, said she had qualified in July, 1926, and had been at the hospital since May, 1927. She produced the prescription which, as the coroner observed, required a mathematical calculation. Addressing the jury, the coroner said that Dr. Scovell had discharged her responsibilities correctly; it was no part of her duties to make the calculation to check the strength of the contents of the bottle. Thallium acetate, he continued, was a continental drug; the weights of it were worked out on the metric system and required to be converted from metric or decimal weight to apothecaries' weight. In this process a decimal was apparently misplaced; consequently the doses were increased tenfold in strength. The unfortunate error, he said, was one of calculation. The result was terrible, but, at the time *the mistake was made, the dispenser* was unaware of the danger of an excessive dose. The jury agreed that the three boys died from an overdose of the drug. The coroner then left to them the question whether what had happened was a mere mistake or whether negligence should be attributed to the dispenser for *having made the mistake.* "Before you can attribute negligence, you must make up your mind that she was not taking due care; this is a mistake in a mathematical calculation, not a careless pouring of a wrong dose from one bottle into another, or taking down a wrong medicine bottle." The jury found as their verdict that death was due to poison accidentally administered; they added a rider that there should be a better system at the hospital of checking weights and measures when making up prescriptions.

A solicitor who appeared at the inquest on behalf of the parents had asked questions which suggested that the treatment was exceptional; the parents' view seems to have been that they should have been specially warned that the drug was highly dangerous, so that they could have decided whether they should allow their sons to have the treatment or not. On this point the evidence of Dr. Bronte and Dr. Roche Lynch was that, though thallium acetate had not been *thoroughly investigated,* it was a recognised and indeed a common treatment. Similar questions were put on behalf of the dispenser in order to show that she might reasonably have been unaware of the danger of an overdose. The verdict of the jury, delivered after a careful and correct summing-up by the coroner, negatives any charge of negligence, and their rider will no doubt receive attention.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED *MARCH 30TH, 1929.*

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 323 (last week 288); scarlet fever, 1919; diphtheria, 1053; enteric fever, 29; pneumonia, 2425 (last week 3578); puerperal fever, 47; puerperal pyrexia, 117; cerebrospinal fever, 20; acute poliomyelitis, 4; acute polio-encephalitis, 2; encephalitis lethargica, 20; dysentery, 7; ophthalmia neonatorum, 113. No case of cholera, plague, or typhus fever was notified during the week.'

Nineteen cases of small-pox were reported from the County of London—namely, Bethnal Green, 3; Poplar, 6; Shoreditch, 2; Southwark, 5; and Stepney, 3. In the vicinity of London an additional 52 cases were reported from West Ham, 1 from East Ham, and 1 from Ilford.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on April 2nd–3rd was as follows:—Small-pox, 163 under treatment, 6 under observation; scarlet fever, 1585; diphtheria, 1811; enteric fever, 9; measles, 98; whooping-cough, 1216; puerperal fever, 20 (plus 6 babies); encephalitis lethargica, 80; poliomyelitis, 4; "other diseases," 62. At St. Margaret's Hospital there were 15 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 2 (1) from enteric fever, 71 (0) from measles, 9 (2) from scarlet fever, 153 (47) from whooping-cough, 41 (9) from diphtheria, 52 (10) from diarrhœa and enteritis under two years, and 536 (70) from influenza.

The number of deaths from influenza in London is lower than that for any week since that ending Jan. 19th, and the Registrar-General's chart shows that deaths from respiratory diseases in general have come down in almost the same ratio. The death-rate from all causes in the 107 great towns is now down to 17·0, Birmingham and Sheffield, which recently suffered so severely, showing rates of 14·9 and 13·9 respectively. The only towns still attributing a number of deaths to influenza are Bradford 26, Birmingham 24, Manchester and Sheffield 16 each, Bristol 15. Many of the Lancashire towns record 5 or more deaths from whooping-cough, including Warrington, Manchester, and Salford.

The number of stillbirths registered during the week was 311 (corresponding to a rate of 48 per 1000 births), including 67 in London).

Obituary.

SIR ANTHONY BOWLBY, BART., K.C.B., K.C.M.G., K.C.V.O.,

LATE PRESIDENT OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND; CONSULTING SURGEON TO ST. BARTHOLOMEW'S HOSPITAL.

WE deeply regret to record the death of Sir Anthony Alfred Bowlby, one of the most prominent figures in our world of medicine, both as a surgeon and as an administrator. The event occurred on Sunday, April 7th, at Stoney Cross, near Lyndhurst, at the age of 73, as a result of pneumonia.

Anthony Bowlby was the son of Thomas Bowlby, a Durham man, who was for a time a London solicitor, but who later led an adventurous life in the Near and Far East, and was on different occasions a special correspondent of the *Times*. Thomas Bowlby died in tragic circumstances in 1860 when in China on his journalistic duties. He was shipwrecked off Point de Galle, and then accompanied Sir James Hope, the English admiral, who was conducting the naval operations against China which followed the breach of the Tientsin Treaty. The conclusion of warfare resulted in the landing of troops at the mouth of Pehtang, and Hope went to Tientsin, where he remained till a treaty was signed in Pekin, but during the operations Thomas Bowlby was taken a prisoner, and died in captivity as a result of the treatment which he received.

SIR ANTHONY BOWLBY.

Photo by Elliott & Fry.

His son, Anthony Bowlby, was then five years old, and he was brought up by his mother, was educated at Durham School, and proceeded thence to St. Bartholomew's Hospital where he duly qualified in 1879 as M.R.C.S. England, proceeding two years later to the F.R.C.S. and filling the house appointments at the hospital. His career as a student was a distinguished one, for he gained many prizes as well as the Brackenbury Scholarship in Surgery. In due course Bowlby became curator of the St. Bartholomew's Hospital museum and completed the catalogue of anatomical, physiological, and teratological specimens, this work being afterwards summarised in his admirable "Students' Guide to Surgical Pathology." As curator he was noted for his intimate knowledge of the specimens and his excellent recollection of many of the clinical histories relating to them. In 1884 he became surgical registrar to the hospital and demonstrator of practical surgery, and in 1891 was elected assistant surgeon on the retirement of Sir William Savory. During his office as registrar he gained the Jacksonian prize at the Royal College of Surgeons of England with a dissertation upon the pathological symptoms and treatment of injuries to nerves, and a few years later he won the Astley Cooper prize with an essay developing the same themes. These two admirable pieces of work were later published in one volume, while in 1887 he delivered the Hunterian lectures at the College of Surgeons along similar lines. He had thus fully justified his election to the staff of the hospital, though he never happened to fill the post of demonstrator of anatomy which at St. Bartholomew's (as at many other of the metropolitan teaching schools) was regarded some 40 years ago as the regular precedent to a staff appointment. But certainly the character of his teaching did not suffer from the omission, for he speedily became recognised by the students as a clear, logical, and forcible instructor, and during the period which followed he built up by his solid work at St. Bartholomew's and at the Alexandra Hospital for Hip Disease a high reputation as an operating surgeon. His clinical teaching was that of a great demonstrator of patients, who combined wide knowledge with a close memory for pathological details. He had a knack of conveying a lesson in a manner that could never be forgotten, as the following extract from a correspondent's letter shows: "My first recollection of Bowlby is a piece of clinical teaching which bit into my memory and never faded. He was going round the wards when he came to a patient suffering from extravasation of urine. After demonstrating the case, he said, in his own inimitable, characteristic, slightly-guttural voice—for he had a little difficulty in pronouncing his 'r's'—'the right thing to do is to make a cut into it, even if you have only got a bit of old rusty hoop iron to do it with.' That sort of teaching was characteristic of the man: eminently practical, simple, and direct, couched in terms which make themselves remembered."

Bowlby's surgery was influenced considerably by Sir Thomas Smith and Howard Marsh, both of whom he had assisted for a very long time. He was never himself regarded as the finest of technicians, nor as a surgeon advancing any particular school of work; in fact, sometimes in his own hospital he was thought to be rather old-fashioned. For instance, he never adopted the method of treating carcinoma of the breast by the sweeping operations which came into vogue in the beginning of this century; he practised himself the smaller local excision, and it is interesting to note that the modern tendency of surgery is with him. His judgment was remarkable. He cared for his patients in every way; he kept them alive, and his opinion was sought always by his colleagues, so that he might have been described as the surgeon to their families.

In 1899 the South African war broke out and Bowlby went to the Cape as chief surgeon in charge of the Portland Hospital, and there laid the foundations of that knowledge of medical-military administration which he later used with such splendid success.

In a book entitled "The Civilian War Hospital" an account was given of the work of the Portland Hospital by Bowlby and the other members of the professional staff—namely, the late Dr. Howard Tooth, Mr. Cuthbert Wallace, Dr. J. E. Calverley, and Surgeon-Major C. R. Kilkelly, the P.M.O. of the hospital. Bowlby describes the sad opportunities offered to the staff to inquire first into the experiences of gun-shot wounds, and, secondly, into the characteristics of epidemic typhoid when the fever began to be serious at Modder River. Bowlby was particularly instrumental in removing camps rapidly from contaminated ground, and the result of his measures of prophylactic hygiene resulted in a remarkable change in the incidence of the fever. In another section of the volume Bowlby and Mr. Wallace (as he then was) give a succinct and detailed description of the surgical work of the war, especially of the surgical aspects of rifle fire, when the warning was issued that the gospel of the innocuous nature of bullet wounds had gone too far, and that there had been too great a confusion between the effects of the penetrating wound made by the projectile and penetrating wound inflicted by sharp instruments. For his services in the South African war Bowlby received the C.M.G. In 1904 he was appointed Surgeon to the Household of King Edward VII., and in 1910 Surgeon in Ordinary to King George, receiving a knighthood.

In 1914 Bowlby received the opportunity for which he was specially fitted. Being at that time a major in the medical branch of the Territorial Force he was attached on mobilisation of our army to the 1st London General Hospital, but his services at G.H.Q. were offered and immediately accepted, and he was appointed consulting surgeon to the Forces with the rank of major-general. The value of his work throughout the war is known to everybody. He became the type of the great medical administrator. He was hard-working, resourceful, clear, and bold. He radiated hope and confidence, while a certain simplicity and generosity of view transformed his abruptness of manner into tactfulness, this being especially displayed in his successful methods of removing friction between the regular and the temporary medical officers—indeed, it is not too much to say that the smooth working between them was largely due to his efforts. His familiarity with the conduct of military medicine gained in the South African war, and his knowledge of hospital administration acquired at St. Bartholomew's Hospital, made of him the ideal counsellor, while his advice always had the admirable backing of first-class professional knowledge. Frequent mentions in despatches were accompanied by the unusual distinction of three knighthoods, for in 1915 he was advanced to K.C.M.G., while in the following year he was appointed K.C.V.O., later C.B., and finally in 1919 K.C.B. In 1923 he was created a baronet.

Bowlby's connexion with the Royal College of Surgeons of England was a long and distinguished one. Winner of the Jacksonian prize and a Hunterian Professor, he was elected to the Council in 1904, and served on that body without break until 1920 when he was elected President in succession to Sir George Makins. He delivered the Bradshaw lecture in 1915 upon Wounds in War, in the course of which he summarised the first year's surgical work as Consulting Surgeon to the British Expeditionary Force in France, compared the conditions in South Africa and France, and described the character of the wounds inflicted by various projectiles with their effects on the tissues. "Nothing has impressed me," he said, "so favourably as the qualities of many of the younger surgeons on whom has rested the chief stress of the actual treatment of the wounded. . . . The care and zeal and patience displayed in efforts to save limbs and life have been no less praiseworthy than the operative dexterity." In this spirit Bowlby always regarded his juniors, and his words are quoted because they illustrate his unceasing aim to establish confidence and justify in the public eye the value that was attached by the high commands to the devoted character of the medical work.

In 1919 he was Hunterian orator at the College and did not experience any of the difficulties which many Hunterian orators must nowadays have in making their words both historical and topical. His address was delivered from the following text written by Hunter himself in relation to his work on bullet-wounds: "My appointment to the Belle-Isle Expedition drew my attention to inflammation in general and enabled me to make observations which have formed the basis of the present treatise." Bowlby proceeded to review military surgery from the time of Hunter in the eighteenth century down to the date of his Oration giving Hunter's and the famous Guthrie's views on primary amputation after gun-shot wound and showing how the percentage of saved limbs had steadily risen. He closed with a brief and clear description of the work of a modern casualty clearing station, showing that the war of movement which characterised the closing stages of the immense campaign just closed had called for the development of new methods. In every way the Oration was alive with topical information, and the audience felt that they were living the life described.

We have attempted to give a description of a great man of affairs, whose keen intellect and strong character showed through every action, while a quiet determination enabled him to carry out what he believed to be the right. For that describes the man.

Sir Anthony Bowlby married in 1898 Maria Bridget, daughter of Canon the Hon. Hugh Wynne Mostyn, and had three sons and three daughters. He is succeeded in the baronetcy by his eldest son, Anthony Hugh Mostyn, who was born in 1906.

ROBERT LAUDER MACKENZIE WALLIS,

M.D. CAMB.

Dr. Mackenzie Wallis, who died at Hove on April 1st, at the age of 43 years, was recognised as being in the front line of chemical pathologists. He had never completely regained his health since the serious illness three years ago when he gave up his general hospital work; his death was due to pneumonia and pericarditis following on extraction of some septic teeth.

DR. MACKENZIE WALLIS.

Educated at Downing College, Cambridge, where he took the natural science tripos in 1908, Mackenzie Wallis devoted himself at first to the study of chemistry, becoming a Fellow of the Chemical Society and demonstrating chemical physiology in the medical School at Cardiff under the late Prof. Berry Haycraft. He then completed his medical education at St. Bartholomew's Hospital, London, qualifying L.S.A. in 1913, and acting as surgical receiving-room officer before he resumed the work more congenial to him of chemical pathologist in the department of bacteriology. This work was interrupted by a period of war service, when he joined the staff of the Welsh General Hospital as temporary captain R.A.M.C. In India, where he was sent, his special merits were soon recognised, and he was seconded from the Corps as a research chemist to the Government of Bombay, where he worked on the purity of anæsthetic agents. Later on he investigated the diastatic output in trench nephritis with a view to elucidating its true nature. Returning at the end of the war he resumed his appointment at Bart.'s until 1926, when he joined the staff of the Children's Clinic, Western General Dispensary, and coöperated in investigations into the biochemistry of the nervous child, in whom he showed the calcium content of the blood to be materially reduced. As a lecturer and teacher of students he enjoyed a good reputation, for he had the essential faculty of stating intricate scientific facts in the simplest language. Side by side with his hospital work he developed a large private practice, in which his special chemical and biochemical knowledge was of great value. He worked particularly at skin sensitisation and the subsequent relief of the toxæmias so detected by the use of vaccines. Biochemical abnormalities in rheumatism, asthma, dyspepsia, and diabetes found in him a competent investigator and therapeutist, and patients came to him from all parts.

One of his colleagues writes: "Mackenzie Wallis was one of the most original thinkers in his branch of medicine. A large amount of routine work did not prevent his speculating on the significance of obscure facts and phenomena; it served him rather as a means for their elucidation. Although in some directions his fertile brain led him astray, in others he achieved a definite advance in work by which he will long be remembered. He was responsible for the hypothesis that the glycosuria of pregnancy is a manifestation of hyperpituitarism—a hypothesis which is now generally accepted. He correlated and defined the value of tests for pancreatic insufficiency; the methods now in routine use for the diagnosis of this condition are accepted largely as the result of his work on their mutual significance. He was responsible also for an original investigation into the pathogenesis of sulphæmoglobinæmia, the results of which indicated that this disease is due to the bacterial synthesis of a reducing substance in the gastro-intestinal tract.

"That Mackenzie Wallis was a tireless worker is sufficiently indicated by the wide field of his original work; that this should have been combined with routine institutional work and practice argued qualities which many must have envied him. His practice, especially in latter years, was a large one, and its success is the best indication of the opinion in which his patients held him. There is no doubt that beyond what he was able to do for them, he was liked by them for some more personal reason. Success in this direction is a thing for which the necessary conditions are hard to define, but the man who deserves it is certainly the man of goodwill and sympathy, and by this criterion Wallis's popularity may well be explained. His good nature was a quality by which all his colleagues will remember him, and he is one of the few men of whom it can be said that he never uttered a harsh word in speaking of anyone."

Dr. Mackenzie Wallis had a very happy family life and was a devoted husband. He leaves a widow and three children to mourn his loss.

ALEXANDER GRANVILLE, C.M.G., C.B.E., M.R.C.S. ENG.

Dr. Granville, who died in London on April 1st after a long and painful illness, had spent the active years of his life as a public health official in Egypt, where he reached the rank of pasha and maintained the high standard of work and conduct which characterised the administration of Cromer and Kitchener.

Alexander Granville came of a Huguenot family and was born at Brighton in 1874. His father died when he was still young, and the boy was taken with his three sisters to Florence, where he attended the day school of Mr. Domeugé, a French refugee, and learned to speak French and Italian fluently. His schooling was completed at Bloxham, in Oxfordshire, whence he entered St. Bartholomew's Hospital, qualifying in 1897. Failing to secure house appointments there for the moment he went on to the West London Hospital as house surgeon and house physician, returning to Bart.'s as resident assistant anæsthetist, a position of some responsibility and of special interest, as gas and oxygen was then just coming into use. While he was holding this post the South African war broke out, and Granville, who as a student had joined the Volunteer Medical Corps, took a commission in this regiment, and was captain before he sailed in 1899. He did good service in the war, obtaining the Queen's medal and three clasps, including Paardeburg; but he contracted enteric fever, complicated by phlebitis, and, returning to duty too soon; the thrombosis which resulted handicapped him throughout life, and was finally responsible for his death at the age of 55 from embolism. The obesity, which was also a legacy of this illness, was a heavy burden of which he made light. Having recovered from his illness he spent some time touring in the Mediterranean and up the Nile in Cook's steamers, and eventually joined the Egyptian army as civil surgeon, from which he was transferred to the public health department of the Egyptian Government. His work in Upper Egypt during the plague visitation of 1907–08 first attracted attention to his energy and administrative powers.

GRANVILLE PASHA.

In 1908, when he was 34 years old, Granville became medical officer of health in Cairo, one of the twenty largest cities in the world, and with a mortality unknown in Europe. A further opportunity soon came to him, for when the Cairo Municipality Section was formed at the Egyptian Ministry of the Interior, he was chosen as its first director, making so conspicuous a success in this post that when the complicated affairs of the Alexandria Municipality were the subject of an inquiry and a change in administration was advised he was appointed director-general there. In 1917 he succeeded Sir Armand Ruffer as President of the International Quarantine Board, a post he held till he retired. During the war, as President of the Board of Conciliation, he did invaluable work during the labour troubles in Egypt, and for his services was created pasha by King Fuad. He was also Red Cross Commissioner for Egypt, Palestine, and Syria from 1917. On retiring from the Egyptian Government service in 1923 his services were retained to attend the meetings in Paris of the Office International d'Hygiène Publique as representative of Egypt. His frequent attendance in Geneva was also required as head of the Egyptian Medical Mission to the League of Nations. It was on one of these journeys from Paris to Geneva that he had the attack of food poisoning which compelled him gradually to relinquish work, and for the last two years he was able to undertake very little.

Of the personal characteristics which led to a life so full of usefulness one of his friends writes: "Granville made a first-rate administrator because he had the faculty for getting things going, and had a charm of manner which made him popular with everyone from King Fuad down to the humblest peasant. He was a good judge of character, and his conversation was pleasant, kind, instructive, and whimsical. He was a fine linguist; his French was perfect, his Italian good, and of Arabic he had a good working knowledge: in any of them he could be witty.

"He had a keen and critical appreciation of many forms of art: painting and its allies, literature and music, good food and good drink. He wrote amusing letters to his personal friends, illustrating them with sketches and drawings in ink or water-colours, and his powers of burlesque were out of the ordinary. If he had not been a doctor he might easily have become a writer or a sculptor."

His honours were many. He was among other things a Knight of Grace of the Order of St. John of Jerusalem, Officer Legion of Honour, a Commander of the Order of the Crown of Italy, a Commander of the Order of George of Greece, a Commander of the Order of Leopold of Belgium, and a Commander of the Hachimite Order of the Nahda. He received the Second Class Order of the Nile (Egypt), and Orders of Medjidieh and Osmanieh (Turkey). His C.M.G. was granted for his sanitary work in Cairo and his C.B.E. for war work.

He married in 1921 Ierne Goold Adams, daughter of Assheton Biddulph, M.F.H., of Moneygwyneen, Birr, Ireland, who survives him.

WILLIAM LOUIS BYHAM, M.R.C.S. ENG.

THE sudden death of Mr. W. L. Byham on March 10th came as a shock to his many friends and patients in Sunbury-on-Thames and neighbourhood. He had been actively engaged in professional duties during the day on which he died.

Born in Ealing, Byham joined St. Thomas's Hospital as a medical student in 1879. After obtaining his qualifications, he spent three years as a medical officer on board ship, during which time he visited China, Japan, South Africa, and the West Indies. In this country he began practice at Spalding and worked there for seven years; afterwards he took a practice at Sunbury-on-Thames. In 1907 he was appointed medical officer of health to the Sunbury Council in succession to Dr. Palgrave, and amongst other appointments was medical officer to the Staines Union, the Post Office, the Metropolitan Water Board, and the Sunbury Orphanage. During the war he was medical officer to the large depôt of the Royal Army Service Corps at Kempton Park, and did much work for local members of the profession, who were called up for duty with the Forces. It is probable that the strain of this additional work caused his heart to become affected and made it increasingly difficult for him to carry the burden of an important practice, necessitating as it did response to unexpected calls at all times of the day and night, especially during the bitter weather of the past winter. A man of unusually good physique, Byham in his earlier life was known in Rugby football circles as a stalwart forward; he was also a good cricketer and all round sportsman. A colleague writes of him that "although a very busy man during recent years, he was never too much occupied to listen to the story of the poorest patients, and his thoughtful cheery manner endeared him to all with whom he came in contact."

Mr. Byham married in 1894 Miss G. Lamb, of Sunbury-on-Thames, who survives him; he also leaves a son and a daughter. The funeral service on March 23rd was largely attended by friends of all ages.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdrs. G. A. S. Hamilton to *Constance*; A. G. McKee to *Centaur*; and J. Kirker to *Victory*, for R.N. Barracks, Portsmouth.

ROYAL ARMY MEDICAL CORPS.

TERRITORIAL ARMY.

Col. G. A. Troup, having attained the age limit, retires and retains his rank, with permission to wear the prescribed uniform.

Capt. F. J. Morris to be Maj.

Capt. F. C. Hilton-Sergeant, R.A.M.C., to be Divl. Adjt. 42nd (E. Lan.) Div., and Sch. of Instn., vice Maj. B. C. O. Sheridan, R.A.M.C., vacated.

Lts. to be Capts.: A. H. G. Down, E. J. P. McDowell, and W. G. Saunders.

H. Baxter to be Lt.

Supernumerary for Service with O.T.C.: Lt.-Col. P. H. Mitchiner to be Bt. Col. and Lt. W. R. Martine to be Capt.

ROYAL AIR FORCE.

The undermentioned Flying Officers are granted permanent commissions: D. A. Wilson and F. E. Lipscomb.

Squadron Leader J. R. Crolius (retired list) is reinstated on the active list as a Squadron Leader.

Flight Lt. F. T. Boucher is transferred to the Reserve, Class D. ii.

Brendan Leo Harrington (temp. Lt., General List, Army, Dental Surgeon) is granted a temporary commission as a Flying Officer (Dental) on attachment to the R.A.F.

INDIAN MEDICAL SERVICE.

The undermentioned appointments have been made in India:—A.D.M.S.: Col. P. H. Henderson, R.A.M.C.; D.A.D.M.S.: Maj. R. A. Logan, I.M.S.; Dir., H. and P.: Maj. (Bt. Lt.-Col.) H. H. A. Emerson, R.A.M.C.; A.D.H.: Lt.-Col. A. C. Munro, I.M.S.; D.A.D.H.: Maj. F. C. Tibbs, R.A.M.C.; D.A.D.'s P.: Maj. C. H. K. Smith, R.A.M.C.; and Maj. R. N. Phease, R.A.M.C.

Capt. J. D. O'Neill retires, receiving a gratuity.

Temp. Capt. Chuni Lal Bhola relinquishes his temp. commn.

COLONIAL MEDICAL SERVICES.

Dr. T. W. H. Burne has been promoted to Senior Surgeon, Federated Malay States.

The following appointments have been made: Mr. F. McLagan, Alienist, Gold Coast; Lt. F. O. W. A. Mahon-Daly, Medical Officer, Nyasaland; Mr. R. E. Henderson, Mr. G. H. Henry, Mr. R. C. Jones, Mr. T. Simpson, and Capt. H. R. F. Tweedy, Medical Officers, West African Medical Staff.

DONATIONS AND BEQUESTS.—The late Mr. D. B. Ritchie, of Glasgow, left, subject to certain life interests, £2000 to the Glasgow Royal Cancer Hospital, and the remainder of his estate to the Glasgow Royal Infirmary, the Western Infirmary, and the Victoria Infirmary.

ALCOHOL IN THERAPEUTICS.—Addressing the Society for the Study of Inebriety on April 9th, Dr. J. D. Rolleston said that a remarkable decline had taken place within the last 30 years in the therapeutic use of alcohol. This was best illustrated by the fall in the alcohol bill in various hospitals and was also exemplified by the practice of individual physicians and the small place which alcohol now occupied in text-books of medicine. The low esteem in which alcohol was held as a therapeutic agent in the United States was shown by the fact that only a minority of practitioners applied for a licence in those States in which the right to prescribe alcohol was granted, while a considerable proportion of this minority used it for illicit purposes. Dr. Rolleston said that the conditions in which alcohol was still chiefly employed were pneumonia, enteric fever, diphtheria, and other acute infections, diabetes, heart disease, tuberculosis, senility, and inoperable cancer, but it did not appear to be indispensable in any of them. The experience at the Western Hospital, Metropolitan Asylums Board, of which he is medical superintendent, had shown that in an annual population of over 5000 patients the consumption of alcohol could be reduced almost to nil without any injurious effects. The factors chiefly responsible for the undeserved esteem which alcohol still enjoyed as a therapeutic agent appeared to be extra-medical influences, personal considerations, and tradition rather than scientific evidence.

Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—H.S., Cas. M.O. Also Cas. Surg. O. Each at rate of £100.

Harefield, Middlesex, County (Tuberculosis) Sanatorium.—Third Asst. Res. M.O. £400.

Huddersfield Royal Infirmary.—Locum Pathologist. 12 guineas weekly.

Hull Royal Infirmary.—Cas. H.S. At rate of £130.

Liverpool City.—Asst. City Bacteriologist. £600.

London Female Lock Hospital, Harrow-road, W.—Hon. Obstet. Surg.

London Skin Hospital, 40, Fitzroy-square, W.—Hon. Dermatologist.

Manchester, Ancoats Hospital.—Res. Surg. O. £200.

Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Hon. Ear, Nose and Throat Specialist.

Manchester Royal Infirmary, Central Branch, Roby-street.—Jun. H.S. £100.

Manchester, Salford Royal Hospital.—Res. Surg. O. At rate of £200.

Manchester, Victoria Memorial Hospital.—Sen. H.S. £250.

Metropolitan Hospital, Kingsland-road, E.—Sen. H.P. and H.S., Jun. H.P. and H.S. Also two Cas. O.'s. Each at rate of £100.

Miller General Hospital, Greenwich-road, S.E.—Out-Patient Officer. At rate of £150.

New Delhi, India, Lady Hardinge Medical College.—Prof. of Anatomy. Rs. 750 a month.

Northern Rhodesia, Roan Antelope Copper Mines.—Chief M.O. £2000.

Preston and County of Lancaster, Queen Victoria Royal Infirmary. Hon Asst. S. and Hon. Asst. P.

Prince of Wales's General Hospital, Tottenham, N. — Res. Sen. H.P. Sen. H.S. and Special H.S. Each at rate of £120. Also Jun. H.P. and Jun. H.S. Each at rate of £90.

Queen's Hospital for Children, Hackney-road, E.—Surg. to Ear, Nose and Throat Dept. Cas. O. At rate of £100. Also H.P. At rate of £100.

Redhill, Surrey, Royal Earlswood Institution.—Jun. Asst. M.O. At rate of £250.

Royal College of Surgeons.—Examiners, &c.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.S. At rate of £100.

St. Andrew's Hospital, Dollis Hill, N.W.—Jun. Res. M.O. £120.

St. John's Hospital, Lewisham, S.E.—Res. M.O. £200. Also Res. Cas. O. and Jun. H.S. Each at rate of £100.

St. Stephen's Hospital, 369, Fulham-road, S.W.—4th Asst. M.O. £300.

Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. At rate of £100.

Sheffield, Nether Edge Hospital.—H.P. £150.

Sheffield Royal Hospital.—H.P. Also Res. Anæsthetist. Each at rate of £80.

Southend-on-Sea, County Borough of.—Asst. M.O £600.

University College, W.C.—Bayliss-Starling Memorial Scholarship. £120.

Warrington Infirmary and Dispensary.—H.P. £150.

Westminster Hospital, Broad Sanctuary, S.W.—Asst. Surg. Reg. At rate of £50.

Wolverhampton Poor-law Institution.—Sen. Res. M.O. £600. Also Jun. Res. Asst. £200.

Wolverhampton and Midland Counties Eye Infirmary.—H.S. £200.

Wolverhampton, Royal Hospital.—Cas. O. and Res. Anæsthetist. At rate of £125.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Wolston (Warwickshire) and Irlam (Lancs).

Births, Marriages, and Deaths.

BIRTHS.

DODD.—On Easter Day, at the Red House, Dartmouth-grove, S.E., the wife of Dr. Frederick H. Dodd, of a son.

SHEPHERD.—On Easter Sunday, at St. Andrew's-crescent, Cardiff, the wife of Dr. C. W. Shepherd, of a daughter.

MARRIAGES.

MOORE—HOLT.—On April 4th, at St. Barnabas, Kensington, Frederick Craven Moore, M.D., F.R.C.P., of Victoria Park, Manchester, to Marjory, second daughter of the late Sir Edward Holt, Bart., and Lady Holt, of Manchester.

DEATHS.

ADDISON.—On April 3rd, at Worthing, very suddenly, Hugh Cecil Addison, L.R.C.P. Lond., M.R.C.S.

BOWLBY.—On April 7th, at Stoney Cross, near Lyndhurst, Sir Anthony Alfred Bowlby, Bt., D.C.L., K.C.B., K.C.M.G., K.C.V.O., F.R.C.S., aged 73 years.

DUHIG.—On April 3rd, 1929, at Heckmondwike, Yorkshire, after a very short illness, David John Duhig, M.D.Trin. Coll. Dub., Fellow Royal Society of Medicine; Hon. Assistant Aural Surgeon, Dewsbury Infirmary. Deeply mourned by his sorrowing wife and family. "Love outlasts death."—R.I.P.

GILLIES—On April 3rd, at Stafford-road, Southsea, J. W. F. Gillies, M.R.C.S. Eng., L.R.C.P. Lond., of Down-street, S.W.

VAISEY.—On April 2nd, at Combe Down, Bath, Thomas Frederick Vaisey, M.R.C.S.E., L.R.C.P., late of Winslow, Bucks.

WALLIS.—On April 1st, at Hove, Robert Lauder Mackenzie Wallis, M.D., of Harley-street, W., aged 43 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

Notes, Comments, and Abstracts.

PITFALLS IN THE RIGHT SIDE OF THE ABDOMEN.*

BY H. W. CARSON, F.R.C.S.,

SENIOR SURGEON TO THE PRINCE OF WALES'S GENERAL HOSPITAL

EVERY surgeon recognises the difficulty of abdominal diagnosis, but we are all agreed that there are many more difficulties on the right side than on the left. When you think of the possibilities of error in left-sided abdominal diseases you see how few they are. It is true one may miss an early stomach cancer, one can mistake a spleen or a kidney for a colonic tumour, one may not realise how often a subacute appendicitis gives pain in the left iliac fossa or even the left hypochondrium. Diverticulitis may be difficult to diagnose and a left ureteric stone may require some study, but these are trifles compared with the right-sided pitfalls.

This is probably due to the protean activities of the appendix, and from the purely vicious, if unconscious, association of right-sided abdominal pain with disease of that organ. When we consider that until 30 years ago it was never suggested that in its quiescent state between attacks the appendix could give rise to symptoms, it is amazing how widespread is the belief that it is responsible for so many troubles. But in addition to the appendix *the right side of the abdomen has many traps for the unwary* and for the most skilful. Diseases of the gall-bladder are traditionally difficult to diagnose, and its close association with the duodenum, anatomically, perhaps, rather than pathologically, makes confusion easy between disorders of these neighbouring structures. Can we be sure of differentiating between those organs by the history, by the symptoms, by our abdominal examination, or by the exactitude of the ancillary methods of survey?

Two years ago or so my friend Dr. J. M. T. Finney, recently Professor of Surgery at Johns Hopkins University, Baltimore, visited at short notice my operation clinic at the Prince of Wales's General Hospital. I hoped to induce him to do his operation of pyloroplasty for duodenal ulcer, and did my best to obtain a case of duodenal ulcer off my list. The only case I could get in was a rather doubtful one, and when Dr. Finney and I went over the symptomatology and X-ray films, we were both unwilling to give a positive diagnosis of duodenal ulcer. He suggested that I should open the abdomen, and if it proved to be a case of duodenal ulcer he would do his operation. Exploration showed the case to be one of gall-stones, and Dr. Finney laughingly said: "It is delightful to come all these miles to see the same mistakes that I make myself!"

Duodenal Ulcer or Gall-stones?

In my experience, one is more apt to diagnose a cholecystitis as a duodenal ulcer than a duodenal ulcer as a cholecystitis. What are the points one relies on? Both those conditions tend to have periods of comparative freedom from symptoms. I am sure that the severe attacks of gall-stone colic are more severe and less amenable to treatment than the severe attacks of duodenal ulcer. I know that sometimes the duodenal ulcer patient will give a very lurid account of his sufferings, and I have seen patients in a bad attack obviously in great pain, but it does not compare with the true gall-stone colic which will cause vomiting, sweating, and collapse, and for which there is no remedy but morphia. But it is the quiescent period, or perhaps one should say in the semi-quiescent period, that real difficulty arises.

In making my preliminary diagnosis before I decide what ancillary investigations should be made, I rely on three points: (1) the history of the attacks; (2) the symptoms during the intervals (the duodenal case is generally quite well unless the appendix is also affected, while the gall-bladder often has flatulent dyspepsia and right shoulder aching); (3) the examination of the abdomen (comparative rigidity of the upper right rectus muscle in duodenal ulcer compared with the same condition of the upper oblique muscles), and Murphy's sign in gall-bladder. Murphy's test consists of an examination of the gall-bladder with the patient sitting up. The surgeon sits behind the patient and, placing his hands on the right and left hypochondria, directs the patient to relax his muscles and take a series of deep breaths. With each expiration the hands are pressed into the hypochondria, the palms of the hands being brought more and more horizontal—after three or four breaths the gall-bladder will be brought down during inspiration on to the fingers of the right hand, and if it is tender there will result a characteristic catch in the breathing. The test differentiates admirably between gall-bladder and kidney affections.

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* Being a post-graduate lecture delivered before the Fellowship of Medicine on March 18th.

*One must not put too much reliance on physical con*figuration, although one is naturally inclined to consider the fair, fat-and-forty matron a more likely host of gall-stones than the thin fine-drawn male, nor must one expect too much help from the patient's likes and dislikes in food.

Special Methods of Investigation.

What of the ancillary methods? *Examination by X rays* has taken the foremost place in both cases. Both have their limitations. I think it will be agreed that radiographic examination after a barium meal does not give as high an average of successes in duodenal as in gastric ulcer. This is due to the fact that the great majority of duodenal ulcers are superficial—that is, there is no crater in which the barium can lodge; while in lesser curve ulcers, at any rate as the surgeon sees them, a crater or a bud is the rule. Craters are rare in duodenal ulcer unless the ulcer is on the posterior or inner surface, and these form quite a small proportion. *And then the shape of the duodenal cap may* be distorted by spasm due to many things, among them cholecystitis. I have under my care at the moment a medical man who has attacks characteristic of duodenal ulcer, with marked deformity of the cap, in whom symptoms occur only in association with phosphaturia and oxaluria. In only two respects does he differ from an ordinary duodenal ulcer; he vomits incessantly during the attack, and he has no hyperchlorhydria. The examination of the gall-bladder by X rays after the administration of the dye is still in its infancy, and has not yet given me the proportion of successful diagnosis which I *consider necessary if I am* to rely on it, nor is it yet decided whether the dye should be injected intravenously or given by the mouth in a cachet.

The Graham Cole test consists in the administration of 3 to 5 grammes of tetraiodophenolphthalein intravenously, in two doses of 35 to 50 grains in kerasol capsules by the mouth. The preliminary preparation of the patient is most important. The gall-bladder is examined radiographically *at varying intervals, beginning four hours* after the injection, or 12 hours after the oral administration, and examinations are repeated several times during the next 24 hours. A healthy gall-bladder *casts a shadow* which becomes gradually smaller and more concentrated, and finally disappears.

The other method is the chemical examination of the *stomach contents in duodenal ulcer*, and the microscopical and chemical examination of the duodenal contents in gall-bladder disease.

I am afraid we are all rather disappointed with the test-meal as a method of clinching the diagnosis. When the fractional test came in, we all hoped great things of it, and the curves certainly looked very instructive, but further experience shows such wide variations in the consecutive examinations that one has begun to lose faith in it. Perhaps the most helpful examination is that of the resting juice which may show variations, both chemical and microscopical, which may be very useful. *The examination of the duodenal* contents by Vincent Lyon's method has never really caught hold of English investigators. I was in Philadelphia last December, and had the great pleasure of seeing my friend, Dr. Lyon, at work. *His method consists in the introduction* directly into the duodenum by means of the Rehfuss tube of 50 c.cm. of a 25 per cent. solution of magnesium sulphate. This gives rise to a rapid discharge of bile, which is then aspirated through the tube. Lyon differentiates between the A bile, first to come, from the common bile-duct, the B bile, second to come, from the gall-bladder, and the C bile from the hepatic ducts, which comes last. In some patients, 15 c.cm. of melted butter, or 30 c.cm. of cream and egg yolk give equally good results.

He showed me some strange things, and there is no doubt that quite a deal of information is forthcoming from this method of investigation both in gall-bladder disease and duodenal ulcer, and there is no doubt it will make its way.

At one time I thought I proved to my own satisfaction *that Bacillus coli cystitis was often associated with gall*-stones, but it is only a chance happening, I believe. Also, we hoped that we might find an excess of cholesterol in the blood, but this has also come to nothing.

Symptoms arising in the Urinary Tract.

My reference to oxaluria may excuse a digression to refer to the very baffling symptoms that this condition can give rise to. My first experience was some 25 years ago, when I dared to disagree with that very eminent surgeon, Mr. C. J. Bond, of Leicester, over the diagnosis in the case of a well-known master of hounds. My diagnosis, which was of appendicitis, carried conviction against Mr. Bond's diagnosis of a minute ureteric stone, and I operated, and have still on my desk an ink-stand given to me by my grateful patient. I sent him away on a sea voyage, and while he was in the West Indies he had a similar attack to the old ones and passed a minute oxalate stone. He sent it to me with a cheery letter. The ink-stand is a *constant check upon any desire I may have to consider* myself infallible.

The last case occurred some two years ago, when I was called upon to see a man who had apparently a severe attack of intestinal obstruction. He was collapsed, vomiting, distended, and all the rest of it. I explored him and found nothing except generalised intestinal distension. I advised the doctor to keep a sharp look-out for the passage of a urinary stone. For three or four days his life seemed to hang in the balance, but he recovered, and 14 days after his seizure he passed an oxalate stone and has remained well. *And that brings me on to the subject of the differen*tiation between the appendix and some renal lesions.

The acute infections are more easy than the chronic recurring attacks. I do not think one ought to mistake a perinephric abscess of hæmatogenous origin for a retrocæcal appendix abscess. The former is never so acute, and rarely leads to an abdominal mass. But to distinguish between a retrocæcal appendicitis and acute ascending pyelitis of pregnancy may be very difficult, especially if the kidney is not functioning, so that pus does not appear in the urine. The most valuable signs of pyelitis are: (1) *acute tenderness in the costovertebral angle*, (2) an initial rigor, and (3) a temperature perhaps as high as 101° F., but certainly higher than is usual in acute appendicitis. Dietl's crises (an intermittent hydronephrosis due to kinking of the upper ureter) may lead to an error, but there is rarely any need for hurry in those cases, and a pyelogram will settle the diagnosis without difficulty.

Appendicitis.

There is the old warning of the danger of mistaking a perforated duodenal ulcer for an acute appendicitis on the grounds that the duodenal contents tend to gravitate to the right iliac fossa and give rise to signs in the appendix area. I am sorry I cannot subscribe to this opinion of difficulty. Even in the absence of a previous history of duodenal indigestion, the *onset*, the *general character* of the abdominal rigidity, and especially the condition of the patient, all tend to make the differentiation easy, and I do not think the mistake should be made, nor is it, I believe, made very often. But I will tell you of an *exercise which* will help you. In any case where I suspect an acute appendicitis, I always set myself and my house surgeon the task of stating the exact position and appearance of the appendix before I operate. As experience accumulates one gets nearer and nearer to the truth, and I have found it particularly valuable in diagnosing the acute retrocæcal appendix which is always the *most difficult*.

Among the more chronic lesions, the differentiation between appendicitis and ureteric stone may be very difficult if for any reason the stone cannot be localised with X rays. *One has then to rely upon the possible occurrence* of urinary symptoms, the presence of abnormalities in the urine, and a cystoscopic examination. That many mistakes are made is evidenced by the number of cases of kidney and ureteric stone we see in which the appendix has already been *removed* without relief. They come to a high proportion of the cases. The only safeguard is that which results from our hospital system where every patient passes through many hands before the diagnosis is definitely settled.

The Distinction of Pain and Tenderness.

Perhaps the greatest difficulty of all, however, is to make a correct diagnosis in the common case of a patient complaining of right iliac fossa pain. Here I would like to draw a distinction between pain and tenderness. Conditions giving rise to *tenderness* are much more easily diagnosed than those giving rise to pain, for pain is purely subjective and varies in significance according to the sufferer's make-up.

Three girls consult you, and each give a story of vague diffuse abdominal pain confined to the right side. The first is apparently in excellent health, you can make nothing out in examination, but you get a history that she has been *vigorously engaged in some sport such as lacrosse or basket*-ball, or lawn-tennis, all designed to put a strain on the right lower abdomen. You suspect a strained external oblique, or even a commencing hernia. The second is equally healthy. She tells you that *last October she had* a rather severe attack of abdominal pain, perhaps with vomiting, that she had to lie up for a week or so, and that she still gets occasional discomfort in the right iliac fossa. You suspect an attack of appendicitis which has *not entirely* subsided. The third is perhaps not quite so healthy or active, and on cross-examination she admits that the pain has been there for a long time, that it gets worse as the day goes on, but is relieved by lying down, *that she is tired* at night, and constipated. You suspect enteroptosis, and find confirmation on examining her general physique and noting the skeletal changes, the loss of weight, the muddy complexion, the circulatory abnormalities which characterise this most common and distressing malady.

It was Dickens, I think, who drew a word-picture of the woman who is fated to be killed by her husband, and this picture is a perfect reproduction of the enteroptotic woman.

Enteroptosis.

I am often asked whether X rays are a help in the diagnosis of appendicitis or enteroptosis. The answer is, that they will help but their value must not be exaggerated. It used to be said that a pathological appendix was evidenced (1) if the barium entered the appendix and remained there for a long time, thus showing that the peristaltic power of the appendix was diminished by fibrosis of the wall, or (2) if the barium did not enter at all, thus showing obstruction of the lumen. But now all are agreed, I believe, that no radiological opinions are to be expressed unless the appendix is visualised. If it is, some opinion can be passed as to whether it is tender—a rather doubtful point—or whether it is abnormally fixed. Enteroptosis, or at any rate a pathological hypermobility of the colon, is also very difficult to estimate by X rays. Everyone of my age was taught that the hepatic flexure was up under the rib, and the caput cæci above the level of the pelvic brim. We know now that in the erect position in health the hepatic flexure is rarely much above the intercristal line, and the caput cæci is quite often in the true pelvis. The same is true of the transverse colon, which, instead of passing obliquely across the umbilical region up to the splenic flexion, much more often sags in the middle almost into the pelvis. What, then, are the radiographers' evidences of a pathological enteroptosis? They may be summed up as evidence of abnormal fixation and delayed function. If the cæcum or transverse colon are abnormally placed and fixed, that is pathological; and if the barium remains too long in the lower ileum or cæcum, this is pathological.

There is one justification for an aphorism which I permitted myself when talking about the operative treatment of intestinal stasis, that it is more surgical to free abnormally fixed organs than to fix abnormally free organs.

Tuberculous Lymphadenitis.

Symptoms which one may confuse with those of the chronic appendix are caused by tuberculous mesenteric glands. These are generally seen in children, though they may occur at any age. They give rise to a characteristic train of symptoms—of which colicky pain is the most important—which are now well recognised since I first brought them before the profession in 1918. When I was in Toronto, in December, I was told that so thorough was the control of the milk-supply that these cases hardly ever occurred. However, they are still frequent, though I think less frequent than they were in London, their incidence having fallen in common with all forms of surgical tuberculosis. A good deal of discussion has centred round the question of whether chronic appendicitis does occur and cause symptoms in children. I have no doubt of it myself, and I am not alone in thinking that some, at least, of the intestinal indigestion so common in children is due to lesions of the appendix. Generally, however, in children, especially in little children, localisation is not very exact, and the patients seem to complain of pain in the umbilical region rather than in the right iliac fossa. Of all forms of interval appendicitis in children, the mucocele gives rise to symptoms most closely resembling those of tuberculous mesenteric glands.

Finally, I might perhaps suggest that we should all make fewer mistakes in diagnosis in right-sided abdominal lesions if we were not obsessed by the ever-present shadow of the appendix.

LOCAL AUTHORITIES AND MATERNAL DEATHS.

To facilitate inquiry into the causes of mortality in childbirth, local authorities having charge of maternity and child welfare may wish to obtain particulars of maternal deaths occurring in their areas, and the Ministry of Health has been in consultation with the Registrar-General as to the best method of procedure. Reports received by the Registrar-General indicate that some difficulties are being experienced both by local authorities and by registrars of births and deaths in establishing satisfactory plans for the provision of early information respecting the occurrence of maternal deaths. It is understood that in some cases registrars of births and deaths are being asked to identify "maternal deaths" in the sense of deaths due to puerperal sepsis and other diseases of pregnancy and parturition. This general grouping comprises over 150 individual causes of death, as enumerated in the Registrar-General's Manual, and the burden of watching for the appearance upon medical certificates of any of these separate causes is one which, in the opinion of the Registrar-General, registrars cannot properly be expected to undertake. Moreover, even if it were possible for this task to be performed without prejudice to the performance of the registrar's normal duties, local authorities would not thereby secure the complete notification of all "maternal deaths," since certifying practitioners often employ an alternative terminology for many of these causes which could not be identified without medical knowledge.

On these grounds the Registrar-General is disposed to deprecate any such arrangement between a local authority and a registrar of births and deaths. It appears to him that the final identification of deaths as falling within the definition of "maternal mortality" is one which can only be made by persons with medical knowledge, and that this selection must necessarily take place after the receipt of the material by the local authority. Where the local authority already obtains complete returns of all deaths under the provisions of Section 28 of the Births and Deaths Registration Act, 1874, or is now prepared to obtain complete returns for the service of its public health administration in regard to both maternal mortality and other matters, no further question will arise. But where the local authority desires information for the purpose of maternal mortality only, and has no other object in view which would justify the provision of complete returns, this purpose would be adequately served by arrangements for the notifications of deaths of females between, say, 15 and 45 years of age.

This section of the death registers would be sufficient to enable the proper selection of maternal deaths to be made therefrom, and the Registrar-General is not at present aware of any other practicable criterion which would meet the purposes in view.

ULTRA-VIOLET APPARATUS.

THE sixth edition of the "Arnold" ultra-violet and other apparatus issued by Messrs. John Bell and Croyden is a useful publication. It contains illustrations, descriptions, and price-lists of a considerable variety of sources of ultra-violet, luminous, and infra-red radiation, together with a detailed account of accessory gear used with these forms of therapy. The protective goggles used in all light clinics should be tested for their transparency to ultra-violet radiation, for many a black glass lets these rays through. The particular goggles illustrated here are, we believe, safe varieties, and those shown on p. 30 are inexpensive and very suitable for hospital work. Mention is made of a useful kind of garment which can be worn during exposure of the body to ultra-violet. This material consists of a mixture of pure wool and artificial silk, which is said to pass approximately 50 per cent. of the ultra-violet; the openness of the mesh may be mainly responsible for this transmission.

UTERINE FIXATION BY TRANSPLANTED FASCIA.

THE operative treatment of retroflexion of the uterus entails certain disadvantages. The Alexander-Adams method, that of shortening the round ligament, avoids adhesions, but the ligament is apt to stretch in women who have to carry heavy weights. Dr. N. A. Podkaminisky, of the Ukraine National Institute of Industrial Pathology and Hygiene, Charkov, suggests an operation which will fulfil the two requirements of permanence and the avoidance of adhesions without altering the length of the round ligament. He proposes to transplant two strips from the fascia lata into the abdominal cavity and attach them to the ends of the round ligament, suturing them along its whole extent. By this means there should be no displacement of the organs in a small pelvis. Observations from the use of strips of fascia for other purposes show that they readily unite with their new neighbours and lose no elasticity or vascular function; they receive, in fact, an additional supply of blood through the new vessels of the scar-tissue. The author is satisfied with the results of the operation, which are to be communicated later.

ROBB'S DIETETIC BISCUITS.

WE have received from Messrs. Robb and Co., Ltd., Nursery Biscuit Factory, Atkins-road, Clapham Park, London, specimens of their well-known productions, including oatmeal biscuits, wheatmeal biscuits, water biscuits, for general use with butter, cheese, and fruit; Bath Oliver biscuits, recommended for indigestion and table use; ginger nuts, rusks of various kinds, and dietetic biscuits, together with their food biscuits for infants. The productions of this firm, which are manufactured with due regard to the requirements of infants and invalids, are palatable and easily digestible, and find a place in many households. The firm will send trial samples to medical men or nurses on application.

Dosage of Isopral and Hedonal.—Dr. A. E. Beryl Harding writes that the dose of isopral and hedonal recommended by Lambert (THE LANCET, March 2nd, 1929, p. 433, col. 1), as a preliminary injection in the anæsthetisation of cats, should have been given as *0·15* (not 1·15) c.cm. per kg.

Lumleian Lectures

ENTITLED

A MEDICAL REVIEW OF THE SURGERY OF THE CHEST.

Delivered before the Royal College of Physicians of London.

By R. A. YOUNG, C.B.E., M.D., B.Sc. Lond.,

FELLOW OF THE COLLEGE; SENIOR PHYSICIAN TO THE MIDDLESEX HOSPITAL; PHYSICIAN TO THE BROMPTON HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST.

LECTURE III.*—SURGERY IN PLEURAL AND MEDIASTINAL CONDITIONS.

(Delivered on March 26th, 1929.)

IT seems probable that the pleura was one of the first parts of the body upon which surgery was successfully practised, while the mediastinum, owing to the difficulty of access and the complexity and importance of the structures contained in it, is one of the last to afford a safe field to the surgeon. Some of the most difficult problems and most vexed questions in thoracic medicine and surgery are afforded by disease or damage in these regions.

SURGERY IN ABNORMAL CONDITIONS OF THE PLEURA.

The first of these which demands consideration is that of empyema.

Acute Empyema.

The treatment of this condition has until recently been far from satisfactory, yet it is strange to find that the modern principles were clearly stated by Hippocrates. His teaching as abstracted by Stephen Paget [1] was as follows:—

> "Having carefully washed your patient with warm water, you must seat him on a firm chair, and then, while your assistant steadies his hands, you must gently shake him by the shoulders, in the hope of obtaining a splashing sound in the affected side of the chest. Operation should not be performed before the fifteenth day after the beginning of his illness. An incision must be made through the skin, where the pain and swelling are most evident, and then the pleura must be opened, either by trephining the rib, or with a sharp instrument, or with the actual cautery. When a sufficient quantity of pus has been let out (and those who suffer from empyema or dropsy of the chest are sure to die if you *rapidly* evacuate the pus or the water), you must keep the wound open with a strip of linen cloth, secured with a thread. *This strip must be removed daily, that the* remainder of the pus may run out. On the tenth day after the operation you must irrigate the cavity with warm wine and oil, for the purpose of cleansing the surface of the lung; these irrigations must be made twice a day. Finally, when the discharge has become thin and serous, you must keep a small rod of metal in the wound, using a smaller size from time, to time till the whole wound has healed."

It is worthy of note that Hippocrates advises cleanliness with no drainage till the fifteenth day, that he used irrigation, and that he recognised the necessity of keeping the wound open till the infection had subsided.

From the time of Hippocrates until recently the treatment of empyema forms a lamentable chapter in the history of medicine and surgery. The Hippocratic rules were followed till the fifth or sixth century, and afterwards were discarded or forgotten, although the cautery and even caustics were sometimes used by the Arabians. Ambroise Paré came nearer to the methods of Hippocrates, for he employed intercostal incision and even resected ribs. In spite of this, repeated aspiration replaced this operation. One surgeon made 74 punctures in nine months in a child of 11 years, obtaining in all 30 pints of pus, and in 1872 a case was published by Bouchut in which the chest was punctured 122 times in 11 months. Till Lister's discoveries there were comparatively few successes from incision, and Dupuytren, when he himself suffered from empyema, refused operation, which is not surprising when his own record was only four recoveries out of 50 cases. Velpeau had no recoveries out of 12 cases, and Sir Astley Cooper said that he could never get a single cure.

One of the most notable landmarks in the history of the treatment of this condition is the report of the Empyema Commission [2] carried out in America at the instance of the United States Army authorities. It was initiated because of the heavy mortality observed in the military camps of that country in the winter of 1917–18, following an epidemic of hæmolytic streptococcus infections of the respiratory tract. The average mortality of the empyema cases before the Commission started its work was 30·2 per cent., and in some camps it was as high as 84 per cent. As a result of the work of the Commission, in the cases treated by them it fell to 4·3 per cent., and they came to the conclusion that death should not occur in cases of empyema, other than tuberculous empyema, unless it were complicated by such conditions as lung abscess and suppurative pericarditis. The occasional occurrence of cerebral abscess can also neither be foreseen nor prevented.

Graham,[3] who was a member of the Commission, and whose admirable and philosophic Gross Prize Essay should be widely studied, points out that there is a marked difference between empyema due to the streptococcus and that due to the pneumococcus, both in pathological development and course. He further suggests that the high mortality in the streptococcal cases is the result of applying to their treatment the principles commonly and correctly applied to pneumococcal cases. There are two fundamental differences between them. In pneumococcal cases the effusion does not generally develop into pus until after the pneumonia has subsided, such cases being called meta-pneumonic. In streptococcal cases the effusion often develops early and is copious and rapidly formed, being thus syn-pneumonic and adding to the dyspnœa and cyanosis. The other difference between the two types is that in pneumococcal cases the infected part of the pleura is soon walled off from the general pleural space by adhesions, while in the streptococcal cases the condition is at first one of fluid free in the pleural space, and generally of thin, sero-purulent character, yet loaded with streptococci. At this stage the condition would be more accurately described as a "pyothorax," as urged by Tudor Edwards.[4] Any attempt to drain the pleura must produce a more or less complete open pyopneumothorax with all its dangers, which are greatly increased, as Graham points out, by the diminished vital capacity, due to the associated lung condition—viz., broncho-pneumonia or collapse, and to the free unfixed mediastinum. On the other hand, if aspiration only is carried out in streptococcal cases at first, relief is given to urgent symptoms, and time is allowed for adhesions to form and thus to localise the fluid into a true empyema. The question naturally arises as to how this event can be recognised. Radiographic investigation may help and should be carried out where possible, but in general a useful and safe criterion is the appearance on aspiration of frank pus instead of the thin sero-purulent fluid. The difference is somewhat reminiscent of the old distinction between "thin, sanious" and "laudable" pus. It is significant in this connexion that Cameron and Osman [5] found that syn-pneumonic empyema in infants was a very fatal condition if early open operation were carried out, and that the meta-pneumonic cases usually recovered.

The Empyema Commission found that, as a rule, the interval between the onset of the streptococcal pneumonia and the development of frank pus was from two to three weeks. On an average four aspirations were carried out during that time. The most important outcome of the Commission's report is that empyema is *not* to be regarded as an acute surgical emergency requiring operation as soon as it seriously diminishes the vital capacity, as has been shown by Graham.

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* Lectures I. and II. appeared in THE LANCET of March 23rd and April 6th respectively.

It was shown by Delorme,[12] in 1893, by some experiments on animals, that even after long compression and collapse by thick organised exudate on the visceral pleura, the lung could expand if this constricting exudate were removed. Quite independently, G. R. Fowler,[13] in October of the same year, carried out an operation devised to liberate the lung. The operation is therefore called the Fowler-Delorme operation of decortication. In many instances this proves to be easier than might be expected. If the plane between the pleura and the adherent membrane can be reached, it is often possible to strip off the latter, when the lung readily expands, especially if the operation is carried out under intratracheal anæsthesia. It is not necessary to remove the membrane from the parietal pleura except at its reflexion on to the visceral layer.

If removal prove to be impracticable, the ingenious manœuvre of discission, suggested by Ransohoff[14] may serve to allow the compressed lung to expand. He criss-crosses or gridirons the thickened adherent exudate down to the level of the pleura by incisions at right angles to one another at a distance of one-quarter of an inch. On gently increasing the intrapulmonary pressure, the incisions widen and considerable expansion of the lung may result, but rarely of sufficient degree to enable the empyema cavity to close.

An operation has been devised and carried out by Colonel W. L. Keller[15] which attempts to achieve both objects of falling in of the chest wall and decortication. He makes a large incision, carries out extensive rib resections, removes the parietal pleura in so far as may be necessary, and carries out a chemical decortication by means of gentian violet, after which the cavity is regularly irrigated with Dakin's solution.

All these procedures involve serious operative manipulation in patients already debilitated by long discharges and with diminished vital capacity, and are not to be undertaken lightly.

A high mortality in empyema cases and a high percentage of chronic empyemata in any series should lead those concerned both from the medical and surgical sides to consider whether there may not be some defect in diagnosis or in treatment.

Tuberculous Empyema.

Pus developing in the pleural cavity in association with pulmonary and pleural tuberculosis is a most troublesome condition, and may be a most serious complication. The term "tuberculous empyema" is unfortunately somewhat loosely applied to several conditions, different in origin, nature, and severity, viz.: (1) A serous, tuberculous effusion which becomes chronic may in course of time become more cellular, especially after tapping, and eventually purulent. This is a tuberculous pyothorax, and if localised could strictly be called a tuberculous empyema. (2) It is well known that in artificial pneumothorax treatment effusion develops in about 50 per cent. of the cases, and that in a fair proportion of these it eventually becomes purulent. This condition is really one of tuberculous pyopneumothorax. A similar condition may develop in cases of spontaneous pneumothorax caused by tuberculous lesions. In such cases the pus may cause little inconvenience, and may only require repeated aspiration or replacement. (3) Cases of pyopneumothorax due to lung rupture or lung puncture, in which secondary infection occurs. This is a most grave condition and may arise in at least four different ways—viz., (1) from lung puncture, either at the initial induction of a therapeutic pneumothorax or, very rarely, from a diagnostic puncture; (2) from rupture of adhesions involving the lung, especially if positive pressures have been used; (3) spontaneous rupture of a subpleural focus of caseation or of a cavity; (4) rupture of a pyopneumothorax through the visceral pleura into a bronchus. In all of these conditions, but especially in the last two, there is the added risk of secondary septic infection of the pleura. The outlook for these patients, apart from active treatment, is extremely grave. On the other hand, Hutchison and Blair[16] suggest that lung rupture in the course of pneumothorax treatment may be commoner than is generally supposed. They observed this complication seven times in the treatment of 120 cases. They describe a typical temperature chart with a sudden rise and a gradual staircase fall in which the previous daily variation of temperature is roughly preserved, with physical signs indicating sudden displacement of the mediastinum and with a change in the intrapleural pressures. By contrast with instances of this type, cases of rupture with secondary septic infection of the pleura may be fulminatingly acute and associated with great shock. It is obvious, therefore, that cases of tuberculous disease in which purulent effusions occur into the pleura, require careful investigation to establish their nature.

My colleague, Dr. L. S. T. Burrell, has been kind enough to give me some very striking statistics of his cases and details of the methods of treatment which he has found most helpful. He found that of his first 309 cases of artificial pneumothorax treatment for pulmonary tuberculosis 181 had no definite effusion—i.e., at most a small amount. Of these 181, 57 were dead in 1926 (31·5 per cent.). Effusion of definite amount occurred in 128, of which 47 (36·7 per cent.) were dead in 1926. In these 128 cases the fluid was clear in 92, of whom 27 (29·4 per cent.) were dead in 1926. In the remaining 36 cases the fluid was pus. Of these patients 20 had died by 1926 (55·6 per cent.). This notably high mortality in cases in which purulent effusion occurs, as compared with those in which the effusion is serous, decided Dr. Burrell[17] to aspirate all cases in which pus occurs, and to try to get the lung to expand. He writes:—

> "If the pus is too thick to aspirate, I introduce 20 c.cm. of Gauvain's modifying fluid (guaiacol g. 2, creosote g. 2, iodoform g. 5, ether g. 10, sterile olive oil 100 c.cm.) and leave this in for 24 hours, by which time the fluid can generally be aspirated easily. I then wash out the pleural cavity with 1 in 5000 methylene-blue solution until it is completely clear, and introduce enough oxygen to allow easy aspiration. but not enough to raise the pressure beyond –6 cm. of water. I watch carefully with the X ray, and if the lung begins to re-expand I encourage this by further aspirations and wash-outs, but if there is no re-expansion I advise thoracoplasty. I carry out the same procedure for spontaneous pneumothorax when once pus forms."

Dr. Burrell's experience of dealing with these cases by this method is encouraging. There is one point which cannot be too strongly emphasised, and that is that purulent effusions in tuberculous disease should never be treated by open drainage, since this can only lead to pneumothorax with permanent external opening. Where this has unfortunately been done, the only hope is in washing out the cavity and eventually carrying out a thoracoplasty in stages if the patient's condition will permit.

Oleothorax.

There is, however, another method of treating these cases of tuberculous effusion which is worthy of note, and that is by introducing oil into the pleural cavity. This was first employed by Weill in 1918 for cases of pyothorax. He used only small quantities of oil, to which oil of gomenol had been added. Archibald and de Carle Woodcock had also tried experiments with liquid paraffin. Bernou, in 1922,[18] used much larger quantities, and the name of "oleothorax" is now applied to this form of treatment. Sterile olive oil or liquid paraffin is used, and oil of gomenol is added in strengths of 5 to 20 per cent. From 400–600 c.cm. are injected, air, fluid, or pus being withdrawn at the same time as the oil is introduced. Burnard[19] introduces as much as 1000 c.cm. These large quantities should only be injected where the pleura has been infected, or where it has been distended with fluid or gas. An interesting study of this subject has been published in this country by Chandler and Roodhouse Gloyne.[20] They give details of the method and a summary of the conditions in which it may be useful. These include cases of chronic effusion and of tuberculous pyothorax, and especially cases where rupture of the lung has occurred. Oleothorax is believed to have an antiseptic action if gomenol is employed, and it may help to secure healing of the rupture. If it fails, then thoracoplasty should be considered.

I may here add, in parentheses, that oleothorax has been recommended for other purposes, viz.: (1) To obviate frequent refills in artificial pneumothorax treatment, where they are not easy to obtain or are undesirable. (2) To limit or prevent adhesions. In this case, if the condition is one of "virgin" pleura—i.e., where air, fluid, or pus are not present—only small quantities should be introduced at first. (3) To delay the progress of obliterative pneumothorax, which often prevents the continuance of artificial pneumothorax threatment.

Dr. R. C. Wingfield has used it at Frimley in three cases with encouraging results. It is to be noted that there is often a definite febrile reaction after the injections of oil.

The method of oleothorax is still on trial, but it promises to be of use in selected cases. At present, however, its field of usefulness is restricted.

Hæmothorax and Wounds of the Pleura and Lungs.

Hæmothorax is most frequently the result of injury or wounds of the pleura and lung. It may, however, occur in other conditions, such as injury or disease of the mediastinum, notably from rupture of an aneurysm or from erosion of vessels by new growth. In cases due to causes other than injury, the condition is usually serious and often rapidly fatal.

The general principles of treatment of hæmothorax after injury have been established by the large war experience of this condition. The report in the "Official History of the War" on Wounds of the Chest, by Prof. T. R. Elliott,[21] to which I have already referred, should become a classic. It gives a clear statement of the general principles upon which chest wounds should be treated, and affords a striking example of the advantages of friendly coöperation by physicians and surgeons.

Prof. Elliott states that prompt surgical treatment can diminish considerably the number of early deaths, and can lessen the period of invalidism by preventing the development of empyema. Thoracotomy and excision of the wound proved to be of the greatest service. He points out that "during the first three weeks all patients must be carefully watched for possible development of intrapleural sepsis, and after that period they need steady attention in order to ensure good expansion of lungs that may have been collapsed beneath a hæmothorax or an empyema." It was found, as was well known previously, that operation was unnecessary in cases of uninfected hæmothorax of small size, such cases nearly always recovering without interference. With large effusions causing any dyspnœa or distress, early aspiration is practicable and advisable, the theoretical objection that the hæmorrhage might recur being unfounded, since clotting of the effused blood takes place with little delay. Early operation is indicated in cases of large simple hæmothorax in a state of massive clot.

In acute infected hæmothorax, infection may spread virulently through the hæmothorax within 24 hours of the wound, while sometimes it may be present and not afford clinical evidence for days. At the earliest evidence of sepsis, whether rise of temperature, development of other general symptoms from examination of the fluid withdrawn, operation, and drainage as soon as possible are recommended. In view, however, of the experience of the Empyema Commission in septic pleural conditions, it would be well in such cases to aspirate repeatedly or to drain by a closed method until frank pus is obtained.

Another condition in which primary and early operation is advised is in abdomino-thoracic wounds with injury of the diaphragm, especially on the left side.

Tumours of the Pleura.

These may be either simple, such as lipoma, fibroma, and perhaps chondroma, or malignant, of which the chief varieties are endothelioma and sarcoma of various kinds.

If a simple tumour is of sufficient size to give rise to symptoms, it should be removed. Malignant tumours of the pleura are rarely diagnosed at a stage when operation is practicable. Cases of endothelioma sometimes commence in a localised form, and if diagnosed should be submitted to the surgeon. The early development of fluid complicates the problem of diagnosis, but we may hope that the earlier use of X rays and possibly diagnostic pneumothorax and thoracoscopy may render some of these cases amenable to early operation, with a chance of success

SURGERY IN MEDIASTINAL CONDITIONS.

There is at present only a restricted field for surgery in the mediastinum. With characteristic ingenuity, surgeons have worked out methods of access to the various divisions of the mediastinum. The anatomical difficulties have been overcome. The real bar to any extensive surgical operation is the loose areolar tissue which intervenes between the important organs situated in the mediastinum. Once infection reaches this tissue, it is difficult to limit its spread.

The superior and anterior mediastina are readily exposed by splitting the sternum. This operation of anterior mediastinotomy was first described by Milton, of Cairo,[22] in 1897, and has recently been extensively employed. The posterior mediastinum can be reached by an operation in which ribs are divided and shingled upon one another after certain sections have been removed. This is Lilienthal's [23] modification of the older operations of Bryant and Enderlen. It is known as posterior mediastinotomy.

The mediastinum can also be reached by a transpleural route after thoracotomy, and this mode of entry is used for certain tumours. The chief conditions in which the physician may require the surgeon's aid are: (1) suppurative mediastinitis, (2) mediastinal tumours and cysts, (3) mediastinal emphysema.

Suppurative Mediastinitis.

This may be either acute or chronic. The acute cases may be traumatic from penetrating wounds or crushing injuries. Perforation and injury of the œsophagus, and ulceration or injuries of the trachea and bronchi from inhaled foreign body, disease of the sternum, vertebræ, or ribs, may all lead to suppuration in the mediastinum. Suppurative conditions of the lungs, pericardium, pleura, or peritoneum may extend into the mediastinum. A suppurating hydatid or dermoid cyst may rupture into it. An empyema near the mediastinum may give rise to the "mediastinal syndrome," as pointed out by Dieulafoy, although the condition is really extra-mediastinal.

The suppurative process is very liable to spread widely, in which case the condition is almost hopeless. On the other hand, if it become localised, it can be reached by the surgeon and drained.

Chronic mediastinal abscesses are usually the result of tuberculous conditions of the mediastinal glands or of the bony walls of the mediastinum. They are usually to be treated like other "cold" abscesses, by aspiration and injections. If due to other causes, drainage is to be effected if practicable.

Mediastinal Tumours and Cysts.

It is in this connexion that the most useful developments of surgery have occurred. Encapsulated tumours and cysts can as a rule be removed readily and without undue risk.

Among the tumours met with are mediastinal goitre, lipoma, chondroma, myoma, fibroma, osteochondroma, and ganglion-neuroma. The cystic

CASE 4. *Complete flaccid paralysis with wrist-drop of the right arm, following a superficial petrol burn; 18 months' duration; no improvement after months of massage and electricity.*—Lorry driver, aged 26, sustained a superficial but extensive petrol burn of the right arm on Jan. 19th, 1927. Healing was delayed but ultimately occurred and left no scar. Owing to the delay in healing he forgot how to use the arm, and complete flaccid paralysis occurred for which he was treated by massage, electricity, and other physical treatments for many months. It was not easy to persuade him that he was wrong in thinking "that petrol burns in and destroys the tendons," and I failed to cure him by psychotherapy after three sessions, each lasting one hour. He returned to treatment by massage and electrical stimulation.

It must be clear that treatment by argument and persuasion is difficult under these conditions. Nevertheless, most doctors are aware of the failure of treatment by massage and electricity, and of the necessity for psychological treatment. It is a pity, therefore, that so little effort is made to apply simple psychological principles, as I believe most of these hysterical disorders can be prevented by the man's own medical attendant. When litigation is at an end and the claim has been settled, physical measures are more likely to be attended by some success, for the man's anxiety has been relieved and he is keen to become a wage-earner again. There can be little doubt that many of these men believe they will be better off if they can secure a lump sum in settlement of their claim. Visions of a small personal business and the joy of being their own master arise in their minds. Too often, unfortunately, does the man invest this money in some business of which he has neither experience nor business capability, and in a short time he is worse off than before. In several cases I have found that the wife or daughter is given charge of the business while the applicant idles his time. These men find it very difficult to secure other employment, as most employers look askance at the man who has already had an accident and been paid a lump sum in compensation.

The following case shows how a man after the claim was settled speedily lost his symptoms and succeeded in spending the money.

CASE 5. *Hysterical gait following compound fracture of both bones of the leg, the result of a motor accident. Complete recovery on settlement of his claim.*—A motor-driver, aged 30, when driving a motor-cycle combination on Sept. 4th, 1926, collided with a motor lorry and sustained a compound fracture of both bones of the right leg. He was in splints and extension for 13 weeks, and was subsequently treated by massage three times a week until April, 1927. In July he was put in charge of a petrol-filling station, as he said he could not apply sufficient pressure with the foot to use the brake of a light car. Despite good bony union and alignment and full movement in the joints, he continued to walk with an awkward gait. On my advice compensation was stopped and the case was heard in court. The claim was settled for a lump sum. Within a week he had bought a new motor-cycle combination and was touring the countryside with vigour. His own doctor, who gave evidence on his behalf, subsequently confessed that my opinion as regards his capability to drive a light car was the correct one. Incidentally, the man was dismissed his employment because of slackness of trade.

The following cases are illustrative of a few hysterical conditions that have been examined by me recently, none of whom show any improvement despite prolonged treatment by ordinary physical measures.

CASE 6. *Hysterical contracture of the fingers after falling; eight months' duration.*—Labourer, aged 30, fell on some planks on Oct. 15th, 1927, bruising his right fingers. He continued at work for a few days despite pain and swelling, and then consulted his doctor. An X ray photograph showed no broken bones or damage in the joints, but despite all local treatment the fingers remained flexed and could not be extended. He did not return to work until January, 1928, but gave up because of pain and tried again in February. Examination showed that the right hand was clammy with the fingers semi-flexed. He could not straighten the fingers voluntarily, and attempts to do so were resisted by active spasm of the flexor muscles. The condition was recognised by his doctor as being "functional," but no attempt was made to teach him relaxation.

CASE 7. *Hysterical wry-neck after a blow on the head; 14 months' duration.*—A collier, aged 40, received a blow on the head from a tub coming off the rails on March 18th, 1927. He was stunned for a few minutes but was able to resume work and finish the shift. His doctor ordered liniment. On March 24th, 1927, he returned to work but gave up because of pain and stiffness in the neck. He then commenced treatment by massage and electricity, which was continued regularly for a period of 13 months but without benefit. X rays showed no fracture and eventually a neck support was ordered which, however, the man refused to wear.

On examination the head was found to be bent forcibly towards the left shoulder, and he was unable to lift it by his own efforts. Attempts to overcome the spasm were resisted by clonic movements of the head, but in a few minutes the head was erect and remained so without support for a few seconds, thereafter resuming the shoulder position. There is no doubt that this is a case of hysterical wry-neck, the position adopted being the one in which he got most relief at the time of his injury. It has been perpetuated long after the necessity for it has passed away. The man's idea of incurability was fostered by the failure of prolonged massage, &c., and yet after a few minutes' gentle persuasion the head was erect and no doubt further re-education would have enabled the man to keep it so.

CASE 8. *Hysterical tremor and slight stammer after compression between two motor-buses; similar condition in 1915 from shell-shock.*—A bus conductor, aged 40, got momentarily squeezed between the back of his stationary bus and the oncoming radiator of another. He was taken to the Royal Infirmary but discharged the same night, as no injuries were discovered. Next day he was trembling all over and had difficulty in speaking. Examination failed to reveal any organic nervous disease, and the tremor was a typical hysterical coarse tremor. A similar condition had been present in 1915 as the result of shell-shock, and he was cured of this in a London hospital on psychological lines with complete recovery.

The variety of symptoms which can occur is legion. The commonest are paralysis of a limb—either flaccid or spastic, contractures, tremors, stammering, awkward gait, and bent backs. Less common are defects of vision and hearing. The symptom most difficult to decide upon is probably pain, but this symptom is just as likely as any other to be perpetuated by suggestion in the man's mind long after the original cause of the pain has been removed. For example, very few surgeons are troubled by complaints of pain in the scar following the radical cure of hernia in private cases, but I have rarely come across a compensation case who did not complain of pain in the scar, despite the fact that otherwise the operation was a success. Too often this pain is encouraged by a medical opinion that a nerve is involved in the scar, and I have even known a second operation performed to relieve this nerve-ending, but without the promised relief. The psychic element is too often overlooked.

In spastic conditions of muscle pain probably does exist to some extent, but this is a physiological result of a constant state of cramp. Immediate relief comes when the man learns to relax the spasm, but this relaxation requires a mental effort; treatment by baths, massage, and electricity invariably fails. Captain S. H. Wilkinson,[5] while recognising that there can be no more powerful source of suggestion of hysterical pain than pain due to organic causes, nevertheless succeeded by explanation and persuasion alone in curing many such cases as readily as the more obvious hysterical conditions. He found that long-continued treatment by drugs and other physical measures increased his difficulties, as their failure to cure merely tended to fix more profoundly than ever in the patient's mind the conviction of his incurability.

The following case is undoubtedly a case of hysterical perpetuation of pain.

CASE 9. *Injury to the back seven years ago; constant pain; doubtful X ray picture; hysterical perpetuation encouraged by wearing plaster jacket for four years.*—A labourer, aged 41, fell backwards on Dec. 28th, 1921, and hurt his back. He continued at full work until April 21st, when he gave up because of pain. Since then he has done no heavy work. X rays have been taken at various times and, while many of these have reported "nothing abnormal," others reported "fracture of the fifth lumbar spine." In consequence of this discrepancy a belt was ordered and, despite the fact that he could move freely, special exercises and massage were also given. In April, 1924, a plaster-of-Paris jacket was supplied by a surgeon who is stated to have remarked: "Unless you are careful, you will be an invalid for life." This jacket was kept on continuously for four years until removed by order of the Court in May, 1928. More X ray photographs were taken and the radiologist reported: "No evidence of injury or disease throughout the entire spinal column. Congenital condition of the spine of the fifth lumbar vertebra present." Contrary evidence was given that this was a fracture and also that some osteo-arthritis was present higher up, and the man was granted three months to recover without his jacket and recommended to try work after that time.

This case, I suggest, is one of hysterical perpetuation of pain, whether a fracture was originally present or not. Failure to cure depended largely on the unfortunate remark of the surgeon who applied the jacket and the prolonged wearing of the latter. A plaster support is no doubt a correct line of treatment for a few weeks until the fracture has healed, but continual application for four years is a disaster.

These few case notes are taken from recent examinations. Similar instances could be multiplied many times.

Treatment.

I have already hinted that the best treatment is preventive. Cases of accident should be carefully and fully examined at the earliest opportunity and an attempt made to form a correct diagnosis. Only in this way can the patient feel confident that nothing has been overlooked, while the doctor has the right to argue away the patient's fear of permanent incapacity. Too often radiographic examination is deferred for many months. If a fracture is found fixation or mechanical treatment is necessary. If no fracture is found the indications are to encourage movement. Undue rest in bed should be discouraged, and the patient taught to rely on his own efforts from the beginning. Too much stress should not be placed on treatment by massage and electricity, unless the patient is taught by the masseur to take an active interest in the proceedings. Hurst[6] relates how he has seen patients being massaged while reading a book or newspaper. Masseurs should have more tuition on the elements of psychotherapy.

I have never seen much benefit from the usual varieties of spinal support. It is impossible to assume that they are successful in causing fixation of the spine, but if they are applied they should be frequently changed and re-examination made. Prolonged treatment of fracture, joint injuries, and contusions by splints, plasters, and other methods of fixation often results in the adoption of a faulty posture or gait which can readily become permanent, as the muscles have adapted themselves to a new tonal length. Re-education is the only method of curing such disabilities and this, no doubt, is the result of the great success of bone-setting, osteopathy, and similar therapeutic measures.

It is obvious from the cases quoted that a little encouragement from the onset would have prevented months of incapacity. The man often believes that the sinews are destroyed or the nerve damaged, and desires his own doctor's assurance that his fears are without foundation. Such assurance is too seldom forthcoming. Only a medical man can diagnose between an hysterical and an organic paralysis. If no organic signs are present, then the paralysis exists because the man thinks he is paralysed, and he should be disabused of his idea and taught to use the affected muscles again. In the early stages the idea of disability is quite superficial and easily removed, but the longer it is allowed to persist and the longer psychological treatment is delayed the more deeply rooted becomes the suggestion and the more difficult to cure. In long-standing cases rapid recoveries are still possible under good conditions, but the general practitioner has lost his chance, and facilities for intensive treatment are difficult to obtain. Symns,[7] in an excellent paper, states that "no patient should be allowed to be in bed when he can be in a chair, and no case should be confined to a chair when he can walk." The doctor must continually stimulate the patient by his personality and energetic encouragement must be given at each visit. Too often is the bedside manner a name for a long countenance and another bottle of medicine. No doctor should be satisfied if his patient develops a paralysis—e.g., a dropped wrist, while the electrical reactions are shown to be normal; nor should a case be labelled hemiplegia if there are no signs of organic disease; nor should, in fact, any diagnosis but hysteria be made unless physical signs are present to support it.

The hysterical element must be looked for in all chronic diseases such as sciatica, rheumatoid arthritis, &c., and the practitioner will often be surprised at the wonderful recoveries which are possible, even after many years of pain and suffering. This hysterical element is probably present in all cases of chronic deafness, as most deaf people make little effort to listen. Even cases of complete blindness were cured in war time, after examination had shown that no organic disease was present and the optic nerve and tracts were intact—yet these had passed through the hands of several eye specialists without recognition of the functional element.

Once the condition is established, the cure requires time, enthusiasm, and confidence in oneself, and the difficulty in private practice is chiefly the lack of time. There is still need for special hospitals where whole-time medical officers can tackle these cases and where an "atmosphere of cure" can be developed. At Seale-Hayne Hospital, as no doubt in others during war time, the atmosphere of cure was encouraged. A patient coming into hospital with an hysterical condition was left for about two days before treatment was started. During this time the already cured cases in hospital would convince him that his recovery was certain and, as many of our cases were treated in the open in full view of the inmates, he would see for himself that such things did happen. A full examination was always made, and once we started to cure we were never satisfied until the cure was complete. A full explanation of the condition was given to the patient, showing how he had developed the idea of incapacity from his wound or injury. Encouragement was then given him to try to overcome his disability. In cases of flaccid paralysis, for example, he was encouraged to contract the weak muscles and his attention drawn to any slight flicker of the muscle which became apparent. In cases of spastic contracture he was taught to relax the contracted muscle. Both contraction and relaxation require voluntary effort on the part of the patient and reliance should not be placed on massage or electricity. No attempt at deep psycho-analysis is required. In some cases of hysteria this treatment is probably ideal, but it is not feasible for the busy general practitioner, and is generally quite unnecessary for the removal of symptoms.

The stages of treatment recommended are explanation, persuasion, and re-education. Under the latter term is included the correct use of the muscles, and it is well not to be satisfied with anything short of perfection. We found that if we stopped half way the ultimate stages were prolonged.

Occasionally, treatment went on for several hours, and in these cases a resistant patient eventually had to give way to a persistent doctor.

It has been written of hysteria: "The patient says—I cannot; the nurse says—he will not; the doctor says—he cannot will." I would suggest that this maxim is responsible for much of the apathy and neglect shown towards hysterical patients generally. The hysterical patient certainly can "will," but he has to be encouraged to do so, and failure to cure will most certainly result if he is treated as a malingerer. In Workmen's Compensation cases I have occasionally heard blame applied to the solicitors who are engaged in the man's interests, but no blame can be attributed to them. They cannot be expected to differentiate between an organic and an hysterical state. The blame must be accepted by the medical profession. There are very few conditions where the diagnosis offers great difficulty if a correct and full examination is made.

I must acknowledge my great indebtedness to Dr. A. F. Hurst for most of the teaching incorporated severe for two years, attributed to family worries, her health being good. The father's family had goitre, the family history being otherwise negative. Her eldest child was aged 8 and the younger 1½. It seemed possible that the first pregnancy at 27 was the starting-point of her ear trouble, the second causing exacerbation. Tinnitus, "like bells," was not severe, and she had no vertigo. Paracusis was well marked—volunteered statement. She never had earache or aural discharge; her voice was typically flat and toneless. She did not suffer from colds or catarrh, and her pharynx and nose were normal. The right tympanic membrane was slightly retracted, and the left showed cerise flush. T.F. 256; not heard by air; bone conduction much increased. Rinne: Very long negative. T.F. 32; no perception.

Parathyroid treatment started. After 4 weeks: "I feel better in myself." The hearing is definitely improved. After 13 weeks: Quite material improvement in hearing; no complaint of tinnitus (but this was not conspicuous before). The improvement in hearing has been remarked by patient, husband, and friends.

CASE 4.—A farmer, aged 28, came complaining of severe deafness beginning 12 years back—i.e., when 16. He had an operation on the nose at that time. His mother had been deaf since she was a young woman, and had been told that it was incurable and would not be improved by operation (almost certain otosclerosis). His own deafness became very much worse after severe influenza early in 1928; he had had a long course of inflation of the ears without benefit. Tinnitus was constant and severe in the right ear, sounding like "machinery," and in the left like "thumping." Nothing changed it. He had had one mild attack of vertigo recently and paracusis was well marked, but he never had aural discharge or pain. His general health was good and he did not catch cold. The Wassermann reaction was negative. His nose was normal with some post-nasal discharge, and the tympanic membranes were quite normal. He heard a shout at six inches with the right ear, but apparently nothing with the left. T.F. 256; definite diminution of bone conduction R. and L. Rinne: Long negative R. and L. T.F. 32; no perception at all. Upper tone limit practically normal.

Parathyroid treatment commenced. After 8 weeks: "I feel fine and have put on a stone." The hearing remarkably improved, observed by patient and relatives. After 13 weeks: The noises are inconspicuous, and the hearing still further improved; he is much encouraged. T.F. 256; bone conduction normal (? some prolongation.)

CASE 5.—A married woman of 38 came complaining of noises in the right ear, which began two months after an operation on her nose 18 months before; she also had recent slight deafness of both ears. Her family history was negative. The noises were constant, high pitched, unaffected by weather or anything else, and had not been improved by large doses of bromide or by regularly repeated aural inflations during 16 months. There was no paracusis (but the deafness was mild). She did not catch colds and never had aural discharge or pain or vertigo, but there was a constant feeling of heaviness in the head. Her nose showed rather a wide passage, with some post-operative atrophy, and excess of clear mucus everywhere. The tympanic membranes were retracted. T.F. 256; bone conduction increased R. and L. Rinne: Many seconds negative R. and L. T.F. 32; no perception.

Parathyroid treatment commenced; she was very sceptical of the results. After 14 weeks: "I'm much better. I feel better than I have for years." Both heaviness in head and noises have very materially diminished; hearing unchanged.

It is not claimed that the treatment is in any but an experimental stage, but it is simple, safe, and inexpensive and does not interfere with ordinary work. If only it leads others to investigate along the same lines, I trust that publication will not be considered premature.

A SCARCITY OF NURSES.—The East Suffolk and Ipswich Hospital is suffering from a scarcity of nurses. The recent epidemic of sickness affected so many nurses that one of the wards had to be closed, an event which has never happened before, and it still remains closed. Three years ago the period of training was reduced from four years to three; consequently the last of the nurses from the old, and the first from the new, period are completing their training simultaneously. The minimum age for the commencement of training has been reduced from 20 to 19. It has been impossible to open the maternity department for its proper work because it has been monopolised by motor accident cases. Complicated maternity cases are being treated in the gynæcological department.

SCHISTOSOMIASIS MANSONI.

BY DR. RAMESES GIRGES,
SURGEON, TANTA (EGYPT).

THE disease which is now known as *Schistosomiasis mansoni* is an endemic infection widely spread throughout Lower Egypt and in certain parts of Upper Egypt, and affects about one-quarter of the whole population. Tanta, where this study was made, is the centre of the largest endemic area of bilharziasis in the world. In over 4000 cases at my clinic I have noted two quite distinct types of the disease—viz., the intestinal and the hepatic—each of which runs its own course, presents definite stages, and has its special pathological lesions and clinical pictures, the one common feature being the presence of the *mansoni* worm. Even the ova, pathognomonic of this disease, are not constantly present; they are absent both in the first and fourth stages of the intestinal type and in the hepatic type. The latter is the more serious form of the infection. It is the condition known as Egyptian splenomegaly.

The intestinal type presents four stages—viz., febrile (toxæmic), dysenteric, papillomatous, and cirrhotic (repair). In fact the description of the disease as a dysentery is misleading; in only the second and third stages of the intestinal type do dysenteriform symptoms appear. Even so the patient seldom complains of dysentery, which is considered a natural event shared by most of the village folk. Furthermore, the hepatic type presents no dysenteric symptoms at all, but a toxæmic, a hepatomegalic, and an ascitic stage.

Epidemiology.—The disease is more frequent amongst villagers than in town inhabitants, and is almost limited to the fellaheen, fishermen, and fikies. It shows little preference for either sex, though more common in males. No age-period is free from it, but it is mostly found in the age-period 15–30. The infection occurs most often in the month of Baoonah (June).

Pathogenesis.—The cercariæ enter the body by piercing skin or mucous membrane, whence they reach the lymphatics and the general circulation, then the portal vein and liver. There they grow to the adult male and female worms. These events constitute the incubation period, and thus far the parasites inflict no apparent harm on the host. From the liver the adult females travel against the blood stream to their definitive position, the inferior mesenteric and middle and inferior hæmorrhoidal veins; during this passage they excrete toxins, for a febrile reaction in the host appears. This secondary migration is the main event provoking what I term the first or toxæmic stage.

The female in a venule in the intestinal submucosa lays her eggs very close to the intestinal lumen. By the action of digestive ferments elaborated by the embryos the eggs pass from the vessel to the surrounding intestinal wall. The postero-lateral spine of the ovum acts as a ratchet preventing it from returning into the vessel. The ova are thus gradually moved through the tissues until they are extruded into the gut lumen, and thence expelled from the body.

If the process were confined to this the disease would be benign. But in every case some of the ova fail to reach the gut lumen. A subacute inflammation is then set up by the mechanical irritation of the tissue by the ova and by the toxins they produce, and they become surrounded by leucocytes. If this "bilharziasis abscess" lies near the lumen of an intestinal gland it bursts and empties its contents into it. The damaged tissue rapidly heals and this process of egg-extrusion and abscess formation constitutes the second intestinal (dysenteric) stage. Multitudes of ova and a corresponding number of abscesses provoke a chronic diffuse inflammation of the mucosa and great epithelial proliferation. The adeno-papillomata thus formed characterise this, the third intestinal, or papillomatous stage. If the patient survive all this a fibroblastic reaction begins at the periphery of the unevacuated abscess, slowly advances towards the centre, and forms the "bilharzial pseudo-tubercle," in which the ovum is surrounded by definite nodules of fibrous tissue. The tubercle, scar formation, and contraction make up what I term the fourth intestinal or stage of cirrhosis repair.

This is the usual picture where male and female worms are present in more or less equal numbers. One sex only may be present, for the descendants of one miracidium are of one sex only—male or female. If the males markedly predominate or are the only sex present (the condition in most of my cases), there exists, besides the mechanical and irritative lesions, others which are purely toxic in nature. These cases show diffuse hepatitis, obviously not caused by ova, oviposition, or by coupling, but by toxins, either elaborated by the adult worms or provoked by their presence. The males when adult wait in the liver for the arrival of their females, and do not migrate to the mesenteric regions. The purpose of that journey, oviposition, is lacking for them. The worms in the body of the host provoke a partial immunity which prevents the arrival of new parasites to mate with those already in the liver, and so the case remains a hepatic bilharziasis, the intestinal lesions being negligible. This constitutes the so-called Egyptian splenomegaly, or what I term hepatic bilharziasis.

Intestinal Type.

My division of the course of intestinal bilharziasis into an incubation period and four stages is in accordance with its pathology. But symptoms characteristic of one stage may appear in other stages. Thus there may be fever side by side with oviposition in the second; oviposition with papillomata in the third, and both phenomena together with cirrhosis of tissues in the fourth. This is accounted for by the fact that the worm lives on an average for 15 to 20 years, the whole time producing lesions. Repeated infection, which could account for the phenomena, is, in my opinion, a negligible factor.

The *incubation period* lasts from three to five weeks, beginning with a few skin symptoms of variable intensity, partly mechanical and partly due to an irritating substance secreted by the cercariæ during their penetration of the skin. This "Baoonah itch" is commonest in the month of June. It is generally described by the patients as a biting sensation rather than an ordinary itch. It occurs in parts exposed to the water, and is followed by the appearance of small red papules 2–5 mm. in diameter, slightly raised above the level of the skin. Papules and itch remain for two to seven days.

The itch is more frequent when the water is stagnant and two to four hours before noon.

First Stage.—I have seen only 3 per cent. of my patients in this stage. It lasts from three to six weeks, and covers the time between the appearance of the first toxæmic fever and the extrusion of ova in the stools.

The onset may be acute, though generally insidious. About four weeks after infection the patient feels persistent headache, malaise in the late afternoon, followed by general muscular pain most marked in the lumbar region and limbs. The fever is remittent, septic, or hectic in type (erroneously called the "urticarial fever"). In some cases there are wheals, acute nephritis and œdema of feet, legs, and scrotum, occasional abdominal pain, a sense of distension, and generally lowered mentality. The wheals are the most important physical sign in this stage. They last from 12–24 hours, but are succeeded by others for 7–8 days. Slight cases manifest no digestive disturbance except occasional constipation, but some have diarrhœa. The abdomen is slightly retracted with rigidity of the muscles of the upper right quarter. There is tenderness, most intense in the region of the gall-bladder. The liver and spleen are enlarged, without exception, since the first week, mostly only slightly, but sometimes markedly so.

The pulse is slow and the blood pressure is usually subnormal. Areas of transient decreased resonance may be observed over the bases of the lungs, due to local œdema. The urine is scanty, dark coloured, of high specific gravity, contains albumin and a large number of granular casts. The blood picture is characteristic; anæmia of chlorotic type, leucocytosis 10,000–20,000 with 30–70 per cent. eosinophilia.

Second Intestinal or Dysenteric Stage.—The cases seen in this stage comprise 58 per cent. of the total number of my series. It is characterised by the presence of the ova in the stools, but without papillomata. Its duration is from two and a half to three years.

The effect upon the nervous system is seen in continuous malaise, indisposition for exertion, weakness, drowsiness, pain in the back, sawing pain in the whole body, and especially in the bones. During the night the patient experiences a sense of fatigue, uneasiness, heat, and sometimes fever. Bronchitis may be the most important symptom, and is accompanied in a few by hæmoptysis.

The patients suffer from anorexia, thirst, and sometimes pain in the epigastrium occurring shortly after meals. However, the most characteristic feature of the disease is an intestinal disturbance which I term schistosomiasis exacerbation. This begins with increased secretion of mucus, abdominal pain, and colic, followed by diarrhœa and tenesmus, with passage of blood and mucus. Attacks occur every 15–20 days and continue for a day or two. The patient when relieved becomes severely constipated for some time, although straining may continue. During the exacerbations all the patient's complaints are aggravated. Proctalgia is present in some and rectal prolapse occurs in one-quarter of the patients. In girls puberty and menstruation may be delayed up to the age of 20–22. In married women the uterus is infantile and the patient is generally sterile. The patients rapidly lose flesh and strength, especially those complaning of much fever or diarrhœa. The fever is a mild remittent type. There is tenderness all over the abdomen, especially in the middle line, ½–2 inches below the xyphoid process, over the cæcum, pelvic colon, and sigmoid. The liver shows a slight enlargement. The spleen can also be felt; its size slowly increases. No papillomata are felt per rectum. With the sigmoidoscope the mucous membrane can be seen deeply congested, velvety, bleeding, rugose, and covered with dense mucus. One of the characteristics of the fæces in this stage is the presence of blood and mucus outside the greater part of the stool, remaining on the top of the mass. This is the typical bilharzial stool, and is intermittently passed as long as the worms are actively ovipositing within the intestinal coats. Blood is present in the fæces in 92 per cent., while mucus was seen in 85 per cent. of my cases. The pulse is regular though quick and compressible. The blood pressure is normal, and the heart-beat is generally normal in character and position. There is chlorotic anæmia, with an average hæmoglobin of 62 per cent. The number of white blood corpuscles may be increased or remain normal. Eosinophilia is generally between 20 and 30 per cent. There is a subacute nephritis, with urine generally scanty, dark coloured, and of high specific gravity. In a quarter of my cases it contained albumin without any bilharzia ova; and in 11 per cent. casts, generally granular.

Third Intestinal or Papillomatous Stage.—The cases seen in this stage comprise 32·5 per cent. of my series. It is a continuation of the second stage with nearly similar symptoms, differing firstly in the formation of papillomata, and secondly in amelioration of the general symptoms due to increased personal tolerance for the disease. The exacerbations still occur every 15 to 20 days, but diarrhœa is present only in 16 per cent. Tenesmus is present in half of the patients and straining in one-third. Rectal prolapse occurs in 36 per cent.

The condition of the bilharziasis victim in the third stage is no better than in the second. The temperature is always below 38° C.; in 75 per cent. it is between 37° and 38° C., with a few pyretic paroxysms showing

458,916 red blood corpuscles per c.mm. of blood.[2] The average deficiency in percentage of hæmoglobin on admission was 11·654 per cent. for boys and on discharge 4·604 per cent., thus gaining 7·05 per cent. in the three months, and for the girls the average deficiency in percentage of hæmoglobin on admission was 14·234 per cent. and on discharge 5·555 per cent., thus showing a gain of 8·679 per cent.

These figures show a marked and very satisfactory improvement in the general nutrition and the condition of the blood, and show how quickly this type of child can be brought to nearly a normal state of health. In addition to the improvement as shown by the above figures children were better mentally and physically in every way, and teachers noticed that on their return to school their standard of intelligence was considerably increased. Instead of anxious and dull faces we have bright, smiling, alert countenances. They are more vivacious and happy, seeming to have a brighter outlook on life.

The scheme undoubtedly justifies itself in its beneficial results. The cost is inconsiderable, and there is every reason to believe that it will be more than recouped in the reduced cost of treatment of actual disease in the future. Meanwhile those who actually observe the youngsters under the regimen of the home are more—far more—than satisfied with the results.

In conclusion, I wish to thank Dr. S. G. Moore, medical officer of health for Huddersfield, for his kind assistance in allowing me to have access to his records and assistance in preparing this paper.

THE USE OF OX BONE PLATES AND SCREWS IN THE TREATMENT OF FRACTURES BY OPEN OPERATION.

By Hamilton Bailey, F.R.C.S. Eng.,
SURGEON TO THE DUDLEY-ROAD HOSPITAL, BIRMINGHAM.

Metal plates fixed by metal screws into living bone have proved to be unsatisfactory, because the metal, being a completely unphysiological substance, causes rarefaction of the bone. It is true that if the metal plate is removed as soon as union of the fracture has occurred these baneful effects are reduced to vanishing-point. Nevertheless, the removal of the plate necessitates a second anæsthetic, and there is a second wound to heal.

Plates and screws made of ox bone, which were introduced by Cunningham,[3] are assuredly much more physiological (Figs. 1 and 2). Once in place, they can be left alone; the plate and the screws are very gradually absorbed.

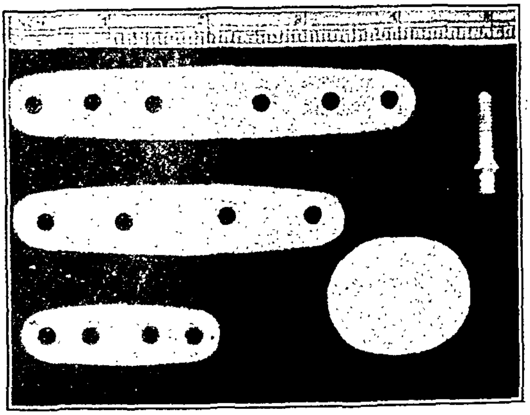
This note is based upon a series, occurring during the past four years, of 39 cases in which ox bone plates and screws were used. They were distributed as follows:—

Femur	13
Tibia	13
Ulna	4
Radius	2
Humerus	2
Skull (defect after trephining)	1
Spine (bolting together of lumbar spinous processes)	1
Separated epiphysis (bone screw)	3

The technique of inserting these plates is a little more complicated than that of inserting metal plates. It consists essentially of the following steps: (1) drilling the bone; (2) tapping the drill holes; (3) inserting the screws; and (4) nipping off the projecting handles of the screws. Certain technical difficulties have been encountered.

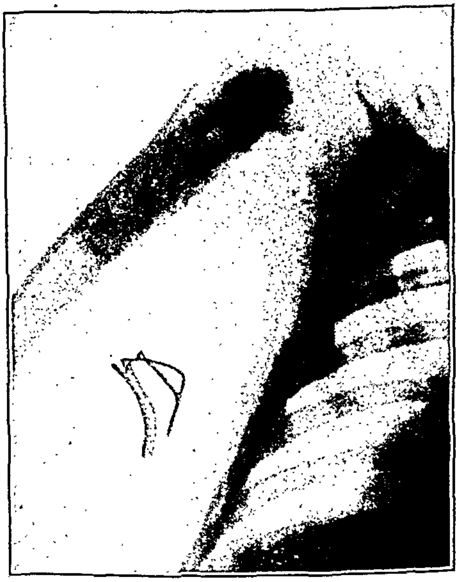
(*a*) *The thread of the tapped bone breaks.*—This is very provoking, and when it occurs, as the screws are of standard size, that particular hole is useless. Breaking of the thread is liable to occur in two stages of the operation. First, as the extremity of the tap enters the medullary cavity. This can be prevented by abstaining from any excessive downward pressure during the insertion of the tap. Secondly, a more fruitful source of this accident is in the endeavour to release the brace from the screw after the screw has been inserted. I found this such a constant source of trouble that I have given up using the brace, and have devised a pair of screw-driving forceps which can be released instantly (Fig. 3).

FIG. 1.



Ox bone plates, screw and disc of bone used for repair of trephine holes of skull.

FIG. 2.



A bone plate used in the operative treatment of a fractured humerus.

(*b*) *Breaking of the bone screw.*—I have had no trouble worth mentioning on this score, but a number of surgeons who are using ox bone plates complain that this is their chief difficulty. The fault, I am sure, lies not in the screws but with the tap. As a tool the tap of stainless steel supplied by surgical instrument makers is not to be compared with the Whitworth tap used in the metal trade. I find the most satisfactory method is to purchase a 3/16ths Whitworth

by

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corpuscles ntific mean of the red blood corpuscle content of toxins, as nd for both sexes at age-periods for different races portal venules by established. For the purpose of this paper (nations elsewhere) I have taken 5,500,000 contraction of scar tie. For comparison only the method or splenic vein; and pig.

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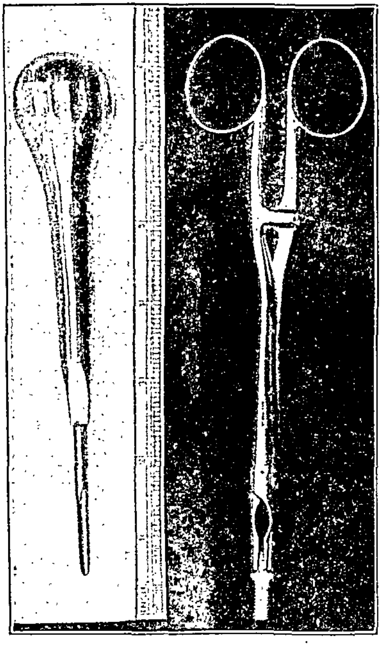
tap from an ironmonger and have it riveted into a metal handle. Fig. 3 shows an instrument assembled in this way. Every six months the tap is changed because repeated boiling dulls its cutting edge. A hole properly tapped will take its screw without force, and we know that it is "home" when the screw-driving forceps free wheel around the projecting handle of the bone screw. Bone screws, unlike metal crews, *are driven with a light hand, for the necessary path* has been cut already by the tap.

FIG. 3.



The instrument on the left is a tap for use after the hole has been drilled in the bone. That on the right is a forceps-screwdriver holding a bone screw.

(c) *Fracture of the plate* has occurred twice in my series—once as the limb was being put into a Thomas's splint at the close of the operation, and once in the fourth week after operation, whilst the leg was being massaged. The first case is instructive, because it *serves to remind us how necessary it is to support* the limb fully during the application of the splint. After a tiring operation there is a tendency, as soon as the last stitch has been inserted, to leave this important step in the hands of others. Nevertheless, I believe that both these fractured plates were largely due to oversterilisation in their preparation. The plates and screws should not be placed in an autoclave, but boiled for 20 minutes on three successive days, and then stored in alcohol until required for use. Sterilised in this way, they should, with ordinary care, withstand the strain which they have to bear.

Perfect first-intention healing of the wound has occurred in all but two cases. In one case a sinus developed over the only metal screw which was used in the series. The use of the metal screw became necessary owing to the breaking of the thread of the tap in two consecutive holes—a difficulty which has already been alluded to, and which, I believe, is now finally overcome. The sinus quickly healed on removing the screw. In the second case (a complicated malunited fracture of the upper end of the femur, in which resection of a portion of the bone was necessary) a hæmatoma developed, which *became infected. This discharged for a month,* and then, fortunately, healed spontaneously, and at the present time (two years after the operation) there is excellent union of the femur and the wound.

In all cases the wounds have been closed by silkworm-*gut sutures only. No buried sutures of any kind* were used. The stitches were removed on the tenth day under personal supervision in the operating theatre.

For the femur I have used A. K. Henry's[*] method of exposure, which is a great improvement on the older methods. For the tibia a large external flap offers many advantages, and I am convinced that whenever possible the plate should not be placed upon the subcutaneous surface of the bone, but upon the external surface, where it can lie snugly concealed by the muscles of the anterior tibio-fibula compartment.

A FATAL CASE OF INFLUENZAL SEPTICÆMIA.

BY ANNE E. SOMERFORD, M.D. MANCH.,
D.P.H. CAMB.,
PATHOLOGIST TO THE ROYAL MANCHESTER CHILDREN'S HOSPITAL,
PENDLEBURY.

OWING to the rapid termination of the illness, and the fewness of the clinical and post-mortem findings, the following case seemed to be worthy of publication.

A well-nourished boy of two and a half years of age, with a history of diarrhœa and vomiting on the previous day, was seen at the out-patient department of the Royal Manchester Children's Hospital on March 22nd. The child appeared to be so gravely ill that he was admitted to hospital without delay. On examination a dusky purple discoloration (not a true cyanosis) of the skin was observed. The temperature was 102° F., the pulse-rate uncountable, and the respiration-rate 80. There were a few scattered râles over both lungs, but otherwise the clinical findings were negative. He had several slight convulsions, and died within an hour of admission to hospital. A post-mortem examination was made within 24 hours of death, but no lesion of any of the organs could be found. A culture was made from the blood within the liver, and this gave a good growth of Pfeiffer's bacillus of influenza, and a few colonies of *Staphylococcus albus.* Death was therefore due to a septicæmia of influenzal origin.

I have to thank Dr. J. F. Ward, at whose suggestion the culture was made, for his kind permission to publish the clinical notes.

A NEW MATERNITY HOSPITAL.—On Tuesday the Prime Minister opened the Lucy Baldwin Maternity Hospital at Stourport, Worcestershire, which has been erected as a model maternity unit for rural areas. The building, which stands high and overlooks the Severn Valley, consists of a main block and an isolation block. In addition to a ward of eight beds there is a private ward.

EDINBURGH HOSPITAL FOR CRIPPLED CHILDREN.—Two years ago it was decided to build an Edinburgh hospital for the treatment of cripples. A sum of £75,000 was asked for. At a meeting held recently in the City Chambers the Lord Provost reported that £50,000 has already been raised to this end, and that a site has been secured at Fairmilehead. The hospital is to provide not only for Edinburgh, but for the whole south-eastern area of Scotland and for the counties of Kinross and Clackmannan and the western half of Fife.

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[*] Henry, A. K.: Exposure of Long Bones. Bristol: John Wright. 1927.

Medical Societies.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

ANNUAL CONGRESS.

THE annual congress of this Society was held in London from April 11th to 13th under the presidency of Mr. Charles Howard Usher. The first contribution was a paper on

Formative Fibrous Tissue Reaction in the Eye,

by Mr. E. Treacher Collins. His purpose, he said, was to describe the form of reaction in the tissues of the eye which resulted in a new formation of fibrous tissue. He classified as follows the conditions giving rise to this reaction: (1) Encapsulating fibrosis. The first of the conditions under this head was in connexion with foreign bodies; the second in connexion with neoplasms, the third in connexion with parasitic cysts. (2) Post-fibrinous fibrosis in connexion with blood-clots. (3) Reparative fibrosis: (*a*) in connexion with developmental defects; (*b*) in the healing of wounds; (*c*) as a sequel of granulomatous inflammation.

In order to explain the conditions observed, Mr. Collins formulated the following general propositions: (1) That a formative fibrous tissue reaction was one of the means which the tissues of the body used for counteracting deleterious influences in their environment. (2) That such a formative fibrous tissue reaction might be excited, apart from any exudation of leucocytes, though at times associated with it. (3) That an aseptic foreign substance implanted in the body, exciting no exudation of leucocytes, might give rise to a formation of fibrous tissue which encapsuled and fixed it. (4) That all neoplasms when they came into contact with tissue of mesoblastic origin excited a formative fibrous tissue reaction, this tending to check their extension into surrounding parts. With slowly growing neoplasms it succeeded in encapsulating the new growth. With rapidly growing neoplasms the cell proliferation outpaced the formative fibrous tissue reaction, and the growth took on malignant characteristics. (5) That any remedial treatment of neoplasms should aim not only at checking the proliferative activity of the cells composing it, but also at promoting the formative fibrous tissue reaction. (6) That parasitic cysts coming into contact with tissue of mesoblastic origin excited a formative fibrous tissue reaction, an encapsulement in a fibrous tissue covering. (7) That coagulated blood in some situations in the body might act like a foreign substance and excite a formative fibrous tissue reaction. (8) That a formative fibrous tissue reaction might be excited in the repair of lesions in the tissues of the body, due to either defective development, traumatism, or a destructive inflammation. (9) That the new formation of fibrous tissue in the conjunctiva in trachoma was a secondary and reparative process which persisted, tending to replace the fibro-adenoid layer which was destroyed. (10) That the new formation of fibrous tissue in the conjunctiva in spring catarrh was a secondary reaction excited by the proliferation and downgrowth of the epithelium, and that it entirely disappeared when the disease came to an end.

Mr. F. A. Williamson-Noble read a paper on

Graded Squint Operations

in which he described his procedures for advancement of muscle according to the result of measurements. A point to remember was that if a convergent squint had lasted some time the external rectus became atrophic. He had been satisfied with the results of recession, or recession combined with tenectomy; he had not operated upon the external rectus alone. For measuring the angle of deviation he used the Maddox tangent scale or the Priestley Smith tape; but a better method was with the Maddox rod and prisms, graduated according to their angle of deviation. Mr. Williamson-Noble did the operation under general anæsthesia, as it was better for the patient and allowed of greater deliberation on the part of the operator. Of 16 cases which he had traced all but two were successful, and one of the failures could scarcely be called such, as she had 45° convergent squint before the operation, and it was reduced to one of 28°. The real failure was due to under-estimating the effect of Wilkinson's resection advancement.

Mr. M. L. Hepburn read a paper on

Some Unsolved Problems in Connexion with Diseases of the Choroid.

His first contention was that primary pigmentary degeneration of the retina was not due, as had been contended by Treacher Collins and others, to nerve degeneration (known as the abiotrophy theory), but to defects in the choroidal circulation. The next problem he attacked was that of the reason for the variations in the visual field defects found as a result of inflammatory deposits and scars in the choroid. He considered that main arteries supplying definite regions were isolated, and that an inflammatory deposit might block one of these main channels, and so produce the sector-shaped defect in the visual field. Next he dealt with the question why some diseases of the choroid terminated in secondary optic atrophy accompanied by a diminution in size of the retinal vessels, while in others, although the greater part of the choroid was involved, the disc and retinal vessels remained normal throughout. His impression was that vascular diseases of the choroid were more likely to end in optic atrophy than were the inflammatory forms. A further question which he discussed was the significance of the variations in amount and distribution of pigment in diseases of the choroid, and whether the appearance of this pigment bore any relation to diagnosis and prognosis. He thought it could safely be said that when pigment appeared away from its normal situation, in most cases one was dealing with a disease of the choroid, probably of inflammatory or vascular origin. Prognosis was not much helped by these appearances.

Mr. Treacher Collins discussed the paper at length.

Mr. Clark Souter reported a case of Uveo-parotid Fever, with Autopsy Findings. The patient was a man 40 years of age, and in addition to the general physical signs he had cycloplegia, dimness of vision, and facial paralysis. There was congestion of the conjunctiva and ciliary region, and permanent deposits of keratitis punctata were found all over the cornea. The latter persisted to the end.

Thursday afternoon was devoted to a debate on

HETEROPHORIA.

Dr. E. E. Maddox (Bournemouth) said that orthophoria, from which heterophoria was a departure, could be defined as "a tendency for the eyes to set themselves truly for the object of fixation." Heterophoria could well be compared to the slackness in the steering-gear of an old motor-car, which in moderate degree was of no consequence, but in larger amount made too great a demand on the subconscious attention of the driver. It was a corresponding tax on attention which gave to heterophoria its importance. Concentration of attention implied active inhibition of every conflicting neuron, Sherrington's "reciprocal innervation" in the motor sphere finding its counterpart in the psychic. The discomfort arising from heterophoria was apt to hover about the occipital region, whereas that of refractive errors was felt at the back of the eyes, in the temple, and the brow. Sometimes a wandering eye suppressed its vision instantaneously, so that no diplopia appeared; but, even so, the suppression made no difference to the effect of the wandering on the aim of the other eye. In one well-marked case, good binocular vision was enjoyed until the object came within two or three feet; then the right eye instantaneously suspended its vision and deviated without diplopia. There were 12 species of paretic heterophoria and 12 comitant. The measurement for the paretic was on the same principles as for frank paralysis. It was important to keep the disc of rods perpendicular to the line between the eye and the light; therefore he had strung one on a kind of gallows, so that it might remain quite vertical, however much askew the head might be placed. The comitant heterophorias were due, he said, to slackness of one of the higher conjugate innervations. Exophoria for distance was, nearly always, due to either subsidence of muscle tone or to convergence deficit. It was very rarely due to divergence excess. Division of the restiform body was said to cause conjugate version of the eyes to the opposite side, combined with elevation of one and depression of the other, confirming the see-saw innervations which the speaker had described in a case. Cyclophoria, if constant, was due to relative inaction of either incyclovergence (in which the two upper poles of the eyeballs approached one another) or excyclovergence (in which they separated). Dr. Verhoeff (of Boston) did not believe in cyclophoria, stating that the fusion of skew images with one another was effected by psychical means only. That was true, Dr. Maddox believed, within certain limits, but many tests showed that the eyeballs could rotate about their visual lines. He would like to see a case in which, in nystagmus, the eyeballs cycloverged in and out, as that would afford a further confirmation of the innervations he was referring to. The version phorias were less easily measured. Dextrophoria and lævophoria were due to imbalance of two innervations; in these conditions there was a tendency for the eyes to look parallel-wise to the right or to the left when at rest. Anaphoria and cataphoria meant a tendency for both eyes to look upwards or downwards, and were due to imbalance of the innervations he called surversion and deorversion. Students were often perplexed as between the terms "duction," "version," and "vergence." Whenever an eye was thought of monocularly one could speak of duction; it meant that an eye was led by its muscles, and the mind did not travel beyond the orbit. Version was a conjugate parallel motion of the eyes effected by conjugate innervations. Vergences were contrary reciprocal motions effected by conjugate innervations. Hence when measuring the amplitude of fusion by prisms it was better to speak of prism vergence tests than of duction tests.

Dr. Maddox then spoke of the tests for heterophoria. Since no refraction was complete without testing for heterophoria, it was desirable to have a speedy method to single out cases requiring more accurate measurement. It was convenient, he found, to have a hand trial frame which could be held in front of the ordinary trial frame, the former having rods on one side and a rotating prism or pair of prisms on the other. The prism could be rotated after telling the patient to say "snap" when the red streak and the light met. For accurate measurement a tangent scale was best, and if there was any suspicion that fusion was not completely suspended, one eye could be screened and then suddenly exposed to see where the streak appeared at the first moment of exposure. The wing-test he regarded as better, as it did away with the prism and ensured accommodation at the required distance.

Exophoria, by the wing test, was generally of trivial account, but esophoria called for a spherical correction which reduced it to nil. To give a weak prism for a large exophoria was often of great value, as it was the last degree of stretch of the fusion reflex which was most fatiguing. An approximate rule was, lenses for exophoria, prisms for exophoria.

Treatment.

It was impossible, said Dr. Maddox, to make rigid rules for the treatment of the condition, as it was a symptom not a disease. The person must be treated, not the phenomenon. Most minor heterophorias did not need treatment, though exceptions could be admitted in the cases of aviators, sportsmen, and others, as it might have importance when the nervous system was tired. The counsel of perfection was to ascertain the cause and, if possible, remove it. Errors of refraction were by far the most common cause, but septic foci in nose, teeth or tonsils, lack of fresh air and exercise, and anæmia could not be left out of account. If refraction treatment failed, the choice lay between exercises or relieving prisms. The former were more suitable for the young, prisms for the old. Any neurasthenia should be treated first. The effective value of a prism was less at reading distance than for a far object. Also, one must make sure that the hyperphoria was not an after-effect of wearing spectacles askew. If present only with the spectacles on, the fault lay with the glasses; if vice versa, the fault which had been in the spectacles was transferred to the eyes. Or the patient might have skewed his spectacles to correct it. For esophoria, prisms were less useful than lenses; the latter were curative. In exophoria, constitutional treatment was more often needed than in the other varieties; it was also the most suitable for training, especially where there was subconvergence. Weak prisms were often helpful; strong ones caused metamorphopsia, robbing the accommodation of the support it was accustomed to receive from convergence. Operations were very suitable in selected cases of heterophoria; in neurotic people there effect was not permanent.

Mr. CHARLES GOULDEN followed. He first described his routine examination of the muscle balance of patients who came with apparent or real refractive errors. Such an examination was obviously necessary. It was important to be certain of the type of deviation—i.e., whether it was concomitant or paralytic. The most important heterophoria was hyperphoria, a want of muscle balance between the eyes in the vertical direction; this form caused most inconvenience, because one had little power over the vertical deviation of the eye. Only when a vertical deviation caused symptoms should it be treated. Among the symptoms were persistent headache, often occipital, confusion of print, sometimes a complaint that lower lines of print surmounted upper lines. The treatment consisted in the use of prisms. If a low degree prism was necessary, this should be placed with the base down before the eye which tended to deviate upwards. If the prism needed was 2°, or more, it should be equally divided between the two eyes—i.e., one prism base down before the upward turning eye, the other base upwards before the downward turning eye. When of high degree, hyperphoria might call for operation; then advancement of either superior or inferior rectus should be done. He referred to four cases he had seen of torticollis due to hyperphoria. There were patients who, immediately the examination was commenced, had a spasm of convergence; these cases were probably hysterical in origin, and needed a careful correction of refraction, probably under atropine, and then such treatment as the hysteria might call for. He had neither operated nor supplied prisms for this condition. In cases which resisted treatment by exercise, especially those in whom an exophoria became a squint—i.e., when the patient was fatigued—operation might be necessary. Here tenotomy was not usually regarded as sufficient, there must be advancement of an internal rectus muscle.

Group-Captain E. C. CLEMENTS (R.A.F.) spoke of his experience in connexion with flying men, pointing out that in the case of an aeroplane in space, the strains and stresses differed from those in people on the ground. He analysed the results of spinning in the Barani chair 10 times in 20 seconds in the case of 118 men. Almost all flying men had good vision. He believed that a big percentage of cases of torticollis would be found to be suffering from hyperphoria.

Mr. Ernest Clarke did not think it was fair to take as normal the kind of case met with in the Air Force. In the ordinary population he regarded hyperphoria as very common indeed, but as it was usually of a minute degree, it was not important. For many years he had advocated the correction of low errors of refraction. When minus glasses were necessary there might be a small exophoria. The latter always lowered the amplitude of convergence, and when exophoria was present the fusion supplement required was always bigger, whereas it was for the ophthalmic surgeon to make the fusion supplement as low as possible. When low refractive errors were corrected, the hyperphoria usually disappeared in a short time. One should not be content with a single test. He objected to the use of prisms for young or middle-aged people; to supply these at this stage was a confession of weakness, and the strength had to be progressively increased.

Mr. H. B. Grimsdale spoke of the people occasionally seen who were greatly helped by a 0·25 cylinder and by a 1 prism. Could rules be laid down, he asked, for dealing with the condition? Probably not. For exophoria he usually advised exercises. He did not think the rôle of hyperphoria in the production of strabismus had been given sufficient attention. Cyclophoria rarely gave trouble.

Mr. Humphrey Neame agreed that in hyperphoria, to relieve the discomfort, the smallest possible prism should be used.

Mr. Harrison Butler said that often, when ordering prisms for elderly people with convergence insufficiency, the relief afforded tended to allow the muscles to repair, after which the prism could be discarded.

Mr. Williamson-Noble described this method of testing for cyclophoria by means of tilted mirrors.

After further discussion the openers replied.

On Friday morning Mr. W. S. Duke-Elder contributed a paper, illustrated by the epidiascope, on the

Nature of the Vitreous.

He said the vitreous was ordinarily conceived of as made up of a framework of fibres forming a close network, in the meshes of which was a fluid, the whole being kept in by a hyaloid membrane which surrounded the vitreous body. The fibrillar framework could be seen with the slit-lamp, though this could only show the optical appearances, the result of the heterogeneity of the tissues through which the light passed. The slit-lamp findings must be elucidated by an unequivocal source, and this was supplied by the ultra-microscope, which was first utilised in this study in 1923. Its magnifications showed the individual molecules, and no fixative was needed. The vitreous was found to be a pure homogeneous gel—i.e., of the consistency of gelatin. In a gel the water became absorbed by or combined with the colloid molecules; it had a high viscosity. On the surface of the vitreous were forces which aggregated together the micelle in close formation. In most cases the chemical composition of the vitreous was the same as that of the aqueous in regard to nitrogen and salt content; but in addition there was present a muco-protein to keep it transparent, and a kerato-protein to keep it gelable. Vitreous was derived largely from the ectoderm in the vitreous cavity. If the gel swelled glaucoma should occur; if it shrank there would be a tendency to retinal detachment. The sclerotic swelled in both alkaline and acid solutions, largely owing to its contained collogen. If the sclerotic swelled the volume of the eye was much diminished and the eye pressure rose enormously.

Sir John Parsons expressed high praise for this piece of research.

Among other papers at this sitting was one by Mr. Eugene Wolff on the

Pathology of Orbital Hæmorrhage and Inflammation.

Hæmorrhage into the orbit, he said, took a longer time to absorb than did bleeding into most other parts of the body, usually held to be because the orbital fat was relatively poorly supplied with blood-vessels. There was, however, another side to the question which had not received much attention. Clinically absorption of hæmorrhage was accompanied by swelling, but in the orbit the contents could only expand anteriorly, resulting in a pushing of the eye forward, thus manifesting itself as a proptosis. When the muscles of the eye had yielded to the full extent of their elasticity the orbit could be regarded as a closed space, and the œdema following absorption of hæmorrhage would cause venous obstruction, and, later, increased transudate. This would explain why orbital inflammation cleared up after a simple incision into orbital tissues without evacuation of pus. The rapid onset of blindness in many cases of orbital cellulitis was probably due to pressure exerted on the optic nerve or on its blood-supply. The indication in these cases therefore seemed to be to relieve the tension in the orbit, while doing a minimal injury to important structures. This thesis Mr. Wolff elaborated and quoted cases.

Mr. Maurice Whiting read a paper on

Optic Atrophy following Hæmorrhage from the Alimentary Tract.

He said that Harbridge found that 240 cases of the kind had been reported up to 1924. The present contribution consisted of records of three cases which had come under Mr. Whiting's own notice, and two others for which he was indebted to Mr. Hepburn and Mr. Doyne. The following could be taken as illustrative of them all.

A man, aged 40, was admitted to hospital in a semi-comatose condition. He had had abdominal pain, had two fits, and was very confused mentally. On admission he was very pale, the mucous membranes were blanched, and there was some jaundice. Soon after admission he passed two hard, black motions, but at the time the man was not thought to have melæna. Next day the motion showed a trace of blood. On August 14th the hæmoglobin index was 0·6, the red cells 15 per cent.; on the 30th the red cells were 19 per cent., and a month later the figure was 43 per cent. Both discs were pale and blurred, and there were small scattered patches of exudate round the discs. On Sept. 4th there was no perception of light in either eye.

The condition, said Mr. Whiting, might follow hæmorrhage from any source, but it was most commonly a sequel of bleeding in the alimentary tract or from the uterus. Many cases had occurred after childbirth or miscarriage, and only rarely after traumatic hæmorrhage. He did not believe the first ocular state was an optic neuritis; it was probably due, in his view, to sudden death of the nerve fibres.

Friday evening was devoted to a discussion on the

Diagnosis and Treatment of Ocular Tuberculosis.

Sir Arnold Lawson, in opening, said the differential diagnosis of tubercle in the eye might be said to rest on one or more of the following considerations: The presence of active tuberculosis elsewhere. In the eye tuberculosis was essentially a surgical rather than a medical condition. Ocular tuberculosis, as an accompaniment of phthisis, was very uncommon. Up to, and even after puberty, bovine, as opposed to human, tuberculosis was very common. Bovine tubercle needed a bovine test, as a negation of human tuberculosis did not exclude the bovine form. The possibility of mixed infection should never be forgotten; there was no reason against active tubercle coexisting with active mixed infection. In ocular tubercle there was an absence of subjective symptoms comparatively with objective signs. These cases were insidious in onset, destructive in character, slowly progressive, and intractable; there was a notable absence of severe pain. He opposed the use of

Calmette's local conjunctival test as being too dangerous. Tuberculous affections of the eye might be either extra-ocular or intra-ocular, the first of these being so-called primary or secondary. He doubted, however, whether tubercle, even of the conjunctiva, could ever be primary; it was certainly difficult to infect the conjunctiva unless a local abrasion was present. Intra-ocular tubercle was always a secondary infection; it might occur in any part of the uveal tract. The most common tuberculous inflammation of the eye was irido-cyclitis. Perhaps choroidal tubercle could not be diagnosed clinically at first sight. Tuberculous masses sometimes reached a great size without causing much trouble. They might disappear under the use of tuberculin. Treatment of ocular tuberculosis must be considered from the general and the local points of view, the former especially in the case of children with phlyctenular disease. In a large number of these benefit could not be expected until superabundant adenoids and enlarged tonsils had been removed. Of a series of 42 cases treated with tuberculin only 10 per cent. showed no improvement; in 45 per cent. healing followed its use. As, however, it might be a dangerous remedy, it should not be used unless it was quite clear that the case was suitable. Probably the value of bovine tuberculin was not yet fully appreciated. Much good had followed phototherapy for these cases, and he was able to endorse Mr. Duke-Elder's findings in this respect in the cases of children with phlyctenular disease. Sir Arnold had not found it of equal value for adults. This treatment should not be regarded as a substitute for, but rather as a supplement to, other methods. The question of the value of local ultra-violet rays was still sub judice.

Dr. R. A. **YOUNG** read a paper on the general systemic aspect of the disease. He said that if medical tuberculosis coexisted with the ocular condition the treatment of the latter must wait on the former. He was cautious in his treatment by tuberculin, using it in his lung cases only when the pulmonary lesions were stabilised and were not causing general symptoms. In the active stage of the disease both tuberculin and artificial sunlight could do harm.

Mr. S. H. **BROWNING** spoke on the subject first from the pathological aspect. As to treatment, he said he had been using bovine and human tuberculin for the eye for 15 years.

Mr. A. L. **WHITEHEAD** emphasised the importance of a thorough search of the whole body for tuberculous lesions when that disease in the eye was suspected. Many of the cases of vitreous hæmorrhage seen in which the cause was not very obvious he suspected of being tuberculous. He was a great believer in tuberculin, which should be begun very gradually.

Mr. **DUKE-ELDER** said he regarded phototherapy as merely an adjunct to ordinary treatment. It was extremely good in phlyctenular disease and other tuberculous diseases of the eye. In 33 cases at Moorfields in which the treatment was employed, the average period of treatment before phototherapy was adopted was two and a half years (75 per cent. had tuberculin injections also). In the period after the introduction of phototherapy 85 per cent. had a quiet eye after an average of five months' treatment; 6 per cent. were very much improved. In 9 per cent. the disease was still active at the end of that time, though there were hopes of much improvement.

Dr. G. **MACKAY** and Mr. M. S. **MAYOU** also took part in the discussion, and Sir **ARNOLD LAWSON** replied.

On Saturday morning Mr. **BERNARD CRIDLAND** opened a discussion on the

Prevention of Minor Eye Injuries in Industry.

He first spoke of the Departmental Committee on the subject in 1922, which gave an excellent survey of the whole question of accidents in industry. Four surgeons had supplied careful notes of eye injuries sustained in the course of occupations in 426 cases, the four being Mr. J. Evans (Birmingham), Mr. A. J. Ballantyne (Glasgow), Mr. R. J. Coulter (Newport, Mon.), and Mr. Cridland. The cases were divided into three main groups: (*a*) Occupations involving exposure to small flying particles, such as workers at grindstones or emery wheels. 51 per cent. of the cases were in this group. Risk of serious injury here was small, the trouble being mainly a foreign body in the cornea. (*b*) Occupations involving exposure to flying chips of metal, 26 per cent. of all. (*c*) Miscellaneous, including such occupations as mining, road-making and repairing, painting, plastering, general labouring, 23 per cent. In 70 per cent. of eye accident cases no form of protection to the eye was available—a fault of employers. In 19 per cent. protection was admitted to be available, but was not used. In the remaining 11 per cent. goggles or machine guards were used, therefore accident seemed to prove them inefficient. After pointing out the economical loss of failure to adopt measures of protection, Mr. Cridland said there were three main lines of prevention—namely, those based upon (1) mechanical guarding; (2) education on the subject of workmen and foremen; (3) engineering revision. Good goggles, he said, gave 100 per cent. protection, shields 90 per cent. protection. The great obstacle to success in all these efforts was the objection of the worker to the wearing of goggles, many regarding them as effeminate.

Mr. J. H. **FISHER** pointed out that the Council of British Ophthalmologists had been actively interested in the same subject. Mr. **TREACHER COLLINS** thought a visor on the lines devised by Sir Richard Cruise for war purposes, with a very fine mesh, might be used; it would be better ventilated than glass goggles. Mr. **JOHN ROWAN**, Mr. **CYRIL WALKER**, Mr. J. F. **CUNNINGHAM**, Mr. M. **HINE**, Dr. G. **MACKAY**, and Mr. A. L. **WHITEHEAD** also discussed the subject, and Sir **JOHN PARSONS** pointed out that American employers in engineering shops took a stronger line than British employers in insisting on workmen using adequate protection.

On Friday afternoon clinical cases were inspected and discussed at the new premises of the Royal Westminster Ophthalmic Hospital. During the congress two rooms were set apart as a museum of ophthalmic appliances, drawings, and literature, the exhibits including goggles damaged during use at various trades.

LONDON ASSOCIATION OF MEDICAL WOMEN'S FEDERATION.

AT a meeting on March 26th Miss F. M. **HUXLEY** took the chair, and an address on

Pain in Relation to Lesions of the Upper Urinary Tract

was given by Miss E. C. **LEWIS**. She distinguished three varieties of abdominal pain caused by lesions of the kidney and ureter: (1) colic; (2) pain in the loin and midaxillary region, due to lesions of the parenchyma; and (3) pain at the outer edge of the rectus abdominis, at the umbilical level, caused by distension of the pelvis. Colic in its most severe form was caused by a stone in the renal pelvis or ureter. Some writers thought that it was due to tension of the kidney capsule, others that it was a spasm of the unstriped muscle. Legueu's work on pyeloscopy seemed to support the view that there would be painful and vigorous contractions behind an obstruction, just as in the alimentary canal. Oddly enough, stones in the calices did not cause pain. Renal colic, however, did not always indicate the presence of a stone; similar attacks, though usually less severe, were caused by the passage of other foreign bodies, such as blood clots from a malignant growth, débris from a tuberculous kidney, or "showers" of crystals; also by irregular spasms in acute pyelitis, and ureteritis, and in Dietl's crises, and crises of nervous origin. The differential diagnosis included biliary and appendicular colics and those of intestinal and pancreatic origin. The radiation of urinary colic was fairly characteristic. The other varieties of pain were more difficult to diagnose; they were often not particularly characteristic of the kidney, and gave no help in distinguishing between the different kinds of renal lesion. A heavy aching pain, often accompanied by tenderness, was associated with large kidney stones, and with ureteric stones impacted above a stricture or with those too large or lying too obliquely to be passed on; in these cases the patient was often unable to lie on the affected side. There were exacerbations due to superimposed attacks of pyelonephritis. A stone impacted in the lower end of the ureter caused vesical pain and frequency. In hydronephrosis, which was merely the evidence of obstruction to the outflow of the kidney, there was aching pain from distension of the pelvis and parenchyma, and, in large tumours, from dragging on the nerves of the pedicle and surrounding structures. Often the smaller distensions were the most painful. A great number of movable and dropped kidneys were symptomless, and required no treatment; others gave varying manifestations, nervous, or referable to the digestive system, including the curious one of jaundice when the affected kidney was on the right side; some caused renal obstruction and infection, with pain, either aching or colicky. Tuberculosis and malignant growths were almost negligible in differential diagnosis, the former because the slight aching in the loin was overshadowed by the bladder picture, and the latter because pain did not occur by itself, but was a late symptom, hæmaturia being the early one.

The simple acute infections were perhaps the most difficult to diagnose and deal with. The milder ones might be painless; often there was tenderness without pain. In more severe cases pain and tenderness in the loin, accompanied by fever, were the dominating features. In the fulminating cases the picture was more that of an acute abdomen. The spasms, strictures, and kinks of the ureter had received more attention in America than in this country. According to Hunner they gave rise to protean manifestations. The pain, when present, was felt in the lower abdominal quadrant, since the lesion was generally situated in the last few inches of the ureter. There might be tenderness where it crossed the brim of the pelvis, and also below the broad ligament. The pain was apt to be intermittent; some patients were only troubled at night, some by day, others in the early morning. There might be a free interval lasting for months. In 75 per cent. the picture was that of irritability of the bladder. The accompanying kidney manifestations were those of the distension and infections caused by the obstruction. Unfortunately, examination of the urine was not always helpful, as it was said to be normal in 30 per cent of these cases.

In differential diagnosis of the chronic types of pain lesions of the upper digestive tract need not be considered, since here there was no relation of pain to the taking of food. Acute perinephritis began just like acute renal infection, but the urine contained no pus, and kidney function was unimpaired. An inflamed gall-bladder was usually tender to pressure beneath the costal margin during deep inspiration. The pain of an appendix was rather more lateral than that of the ureter, and did not radiate in the same way. A lesion low enough in the ureter to simulate one in the uterine appendages would cause frequency. Calcified mesenteric glands must be remembered, and also radiation along the lower dorsal nerves, secondary to spinal or thoracic diseases.

BRIGHTON AND SUSSEX MEDICO-CHIRURGICAL SOCIETY.

An Alternative to Wheelhouse's Operation.

At a meeting of this Society on April 4th, with Mr. Geoffrey Bate, the President, in the chair, a paper on Retention of Urine was read by Mr. H. J. McCurrich. This condition, he said, might easily be overlooked when present, or diagnosed when absent. The former error was due to mistaking retention of urine with overflow for retention of urine; the latter to a failure to diagnose suppression of urine. A catheter would solve the difficulty, and should always be used before a diagnosis of incontinence was made. Mr. McCurrich had seen a patient who had been placed in seclusion as a case of mania. The real trouble was uræmia and retention of urine due to an enlarged prostate; his retention of urine with overflow had been mistaken for incontinence. In partial retention of urine, residual urine remained after micturition, and its amount indicated the degree of obstruction or the weakness of the bladder.

After a historical survey of the subject, and a consideration of causes, Mr. McCurrich concluded his paper with a discussion of operative measures. External urethrotomy, he said, apart from puncture for the relief of retention, dated from the early part of the nineteenth century, and in this country was associated with the names of Guthrie and Syme and, later, Wheelhouse. The disadvantage of Wheelhouse's operation was that great difficulty might be experienced in finding the way through the stricture when the urethra in front of it was opened. He had therefore devised the following operation.

> The patient is anæsthetised spinally and placed in the lithotomy position. The bladder is opened suprapubically by a small incision into which is introduced a finger, and along this a sound is passed into the internal urinary meatus and along the prostatic urethra. Another sound is passed through the external urinary meatus along the anterior urethra. The tips of the sounds are then only separated by the stricture; a perineal incision on to the tops of the sounds divides the stricture. The tips of the sounds are exposed; the anterior one is rotated to extrude its tip. Each end of a piece of rubber tubing about the size of a No. 12 catheter is tied on to the sounds, a long window being cut close to the end of the one tied to the posterior sound. The sounds are withdrawn by the way they entered, the tube is drawn in with them, so that it traverses the urethra and bladder; each end of the tube is secured by a safety pin, so that, however restless and uræmic the patient is, there is little risk of his extracting the tube.

Each day, said Mr. McCurrich, the tube might be moved to and fro by means of the pin at each end, and in this way the urethritis associated with an indwelling catheter was diminished. The tube might be left in up to a few days or a week. The subsequent treatment and dilatation were the same as for a Wheelhouse operation. He had performed this operation first in 1925 and had done it twice since. The fact that the tube traversed the suprapubic wound did not delay healing.

DEVON AND EXETER MEDICO-CHIRURGICAL SOCIETY.

At a meeting of this Society held on March 28th, with Dr. Bertram Cohen, the President, in the chair, a paper on eight cases of

Acute Intussusception in Infants

was read by Dr. J. Douglas Murray. There were four patients, two of whom had one attack of intussusception each, whilst the other two had three attacks each. The cases occurred, he said, during a period of 13 months, and all four patients were males, healthy and robust, between 3 and 22 months of age. Six of the attacks occurred in children under 12 months' old, and these were breast-fed, except one child which was being weaned during the week before the onset of acute symptoms. Dr. Murray called attention to the fact that information about the ordinary food of the infant is rarely forthcoming in the notes of hospital cases, owing to the acuteness of the condition and the desire to remedy it as soon as possible after the child's admission. In the case of the children under 12 months of age careful inquiries about diet were made at the time of admission, and dietetic errors or alterations were proved in each instance in spite of the mother's statement that the child was breast-fed. Inquiries by Fitzwilliams into the seasonal incidence of the disease showed that the maximal number of cases occurred in March and December, and that there was a steady decline in the incidence of intussusception during the summer and early autumn months when epidemic diarrhœa was most rampant. Also the majority of cases of epidemic diarrhœa occurred in children who were artificially fed, whereas acute intussusceptions were most often seen in healthy, breast-fed children. There seemed, therefore, to be no justification for regarding acute enteritis as a predisposing cause of acute intussusception.

Dr. Murray said that two of his patients had died, each with hyperpyrexia; in both these cases, and in these two cases only, could the intussusception be felt per rectum. The other two children recovered, each of them having three intussusceptions during the period of 13 months; there was never less than four months' interval between one intussusception and the next. In each case treatment was by laparotomy, with manipulative reduction of the intussusception. Dr. Murray discussed the non-operative treatment of this condition, and mentioned that uncertainty as to whether there was complete reduction of the intussusception seemed to be an insuperable drawback to this line of treatment. He concluded by considering the ætiology of the condition, and said that he regarded hypertrophy of the lymphoid tissue in the lower end of the ileum, consequent upon intestinal irritation produced as a result of some error in diet, as the chief cause of acute intussusception in infants.

The **President** mentioned two cases of which he had had personal experience. In the first the stools passed immediately after reduction contained a stub of asparagus. In the second the last portion could not be reduced and had to be opened up. An inflamed appendix containing pus was found inside.

Mr. A. L. **Candler** said that in his opinion elongated mesentery was the primary cause and that dietetic errors provided the stimulus. As regards diagnosis, he emphasised the importance of emptiness in the right iliac fossa and stated that in some cases the lump could not be felt without an anæsthetic because it was high up under the liver or lower ribs, but that under an anæsthetic the hand could be pushed up higher and the lump palpated.

Mr. N. F. **Lock** drew attention to the lessened incidence of acute intussusception.

Mr. R. **Wayland Smith** was of opinion that if a change of diet, or dietary indiscretion, was the cause of intussusception, a much higher incidence of cases would be expected, and agreed with Mr. Candler that the underlying condition which made an ileo-cæcal intussusception possible was a congenitally long mesentery.

In his reply Dr. **Murray** said that the cause of intussusception was a moot point, but agreed that the most probable cause was an error of diet in children with an abnormally long mesentery. He thought that the "signe de Dance" was of doubtful value.

Southend General Hospital.—It has now been decided to proceed with the first portion of the proposed new hospital at Southend-on-Sea. This section, which will cost £111,000, will contain 164 beds, 40 of which will be for children, and others for paying patients. It will also include a nurses' home with accommodation for 60 nurses.

Queen's Hospital, Birmingham.—It was stated at the annual meeting of this hospital that 15,386 casualties were treated last year, and that ten beds have now been endowed by the efforts of the university students. On behalf of the medical staff the need was emphasised for a supply of radium, and for the provision of beds for paying patients.

Reviews and Notices of Books.

RECENT ADVANCES IN NEUROLOGY.

By W. **Russell Brain**, D.M. Oxf., M.R.C.P. Lond., Assistant Physician to the London Hospital; and E. B. **Strauss**, B.M. Oxf., M.R.C.P. Lond., Medical Registrar to the Hospital for Epilepsy and Paralysis, Maida Vale. With 38 illustrations. London: J. and A. Churchill. 1929. Pp. 412. 12*s.* 6*d.*

This addition to the "Recent Advances" series makes excellent reading. In the last few years so much attention has been given to neurological research that the problem of what to omit must have been even more difficult to solve than that of what to include. In their range of selection the authors have been catholic enough for all minds, seeing that the matters discussed include, to mention but a few, questions of the cerebro-spinal fluid, neurotropic viruses, classification of cerebral tumours, conditioned reflexes, posture and tonus, X ray treatment of nervous diseases. In other words, physiologist, neuropathologist, clinician, and therapeutist alike will here find something of value for themselves. In one or two passages suspension of judgment might have been adopted. The statement, "it must now be regarded as established that the anatomical basis of encephalitic Parkinsonism is a lesion of the substantia nigra," reads curiously when, on the next page, we are informed that "the anatomical site of the lesion in paralysis agitans is more problematical." Further, these remarks leave untouched the question of whether, on other grounds altogether, a lesion of the substantia nigra is sufficient for the manifold semiology of that state. Again, it is inaccurate to say that the symptoms of "circus movements, difficulty in taking food, chewing and swallowing, voice disturbance, hypertonicity, tremor, athetoid movements, and constriction of the pupil," produced experimentally by striatal lesions in cats, "correspond strikingly" with those of hepatolenticular degeneration; some do, others assuredly do not. In some instances, again, the views of authors have not been reproduced with precision. But, on the whole, little complaint will be made by the many authorities whose work is summarised. Nor does perusal of the volume leave the impression of a mere réchauffé of the work of others; a book of this kind must contain numerous references to, and descriptions of, the investigations of neurologists, but these are here subjected to a careful sifting process; in passing through the minds of the two authors they have been freed from non-essentials and given a place in a general setting so that they can be appreciated at their true worth. This task must indeed have been far from easy, and we congratulate the writers on its efficient accomplishment.

NEUROBIOTAXIS.

Three Lectures on Neurobiotaxis and other Subjects. Delivered at the University of Copenhagen. By C. U. **Ariens Kappers**, Amsterdam. London: William Heinemann (Medical Books), Ltd. 1928. Pp. 76. 7*s.* 6*d.*

Three lectures, reprinted from the *Acta Psychiatrica et Neurologica*, are here published in convenient form, and deserve the neurologist's attention. Dr. Kappers is the exponent of that "psychical" law in the structure of the nervous system which he has called neurobiotaxis; in these pages its nature and mode of working are clearly and succinctly described. The second lecture deals with the corpus striatum from the standpoint of comparative anatomy and physiology; the third, with the development of the cortex and the functions of its different layers. Each subject is handled in a masterly way. Dr. Kappers doubts whether the highest development of the corpus striatum is found in man; compared with the brain-stem its size is larger in some of the lower animals. He shows that in the archicortex there is a general differentiation into two layers only—a granular receptive layer near the surface where most afferent impulses run, and a deeper (subgranular) efferent pyramidal layer. In addition to these two, the neocortex possesses a third or supragranular layer, whose development distinguishes the higher levels in the animal series, and is a consequence of increase of corticipetal and associative fibres.

Tweedy's Practical Obstetrics.

Sixth edition. Edited and largely rewritten by Bethel Solomons, M.D., F.R.C.P.I., Master, Rotunda Hospital. London: Humphrey Milford, Oxford University Press. 1929. Pp. 759. 25s.

This book, for 20 years well known and greatly appreciated, appears now in a slightly extended form under the guiding hand of the present Master of the Rotunda, who collaborated with Dr. Tweedy in the previous edition. Now solely responsible, Dr. Solomons has impressed his style and teaching on a work which always had a character of its own and has made the blend of the old Master and the new into a wonderfully uniform composite production. Doubtless amalgamation was simplified by the close relationship of teacher and pupil and by the fact that the book represents the practice of one great hospital in which both have served and in whose traditions both are versed.

Dr. Tweedy's original aim was to fill blanks in the practical knowledge of the recently qualified, and he omitted "all that is theoretical and not immediately useful to the practitioner." Dr. Solomons has wisely added an introductory portion contributed by Prof. Bronté Gatenby on anatomy and embryology, and himself has inserted the physiological matter necessary to open the appropriate chapters in Part II., covering normal pregnancy, labour, and puerperium. Part III., on abnormal pregnancy, begins with a chapter on toxæmia, and here the new author has allowed himself almost too complete an absolution from the restrictions of the title and original purpose of the book, and has devoted some few pages to theory before he gets down to the practical aspects of his subject. When he does so descend, however, he gives a clear and exhaustive account of the Rotunda method of treating eclampsia. Here he insists on "the necessity of paying the very strictest attention to every detail of this treatment," and in support of this injunction can point to the excellent results obtained in his hospital.

It is interesting to note a few changes that have come from a review of further experience of the methods recommended in previous editions. In accidental hæmorrhage the old Rotunda method of vaginal plugging, so strongly advocated by Tweedy, is now rarely employed and is reserved for cases in which the simpler treatment now advised fails to curtail bleeding and signs of collapse persist. Submammary saline infusion, rupture of the membranes, and injection of pituitary extract form the basis of the treatment now adopted. Another subject on which views have been reconsidered is uterine inertia, since, like many others, Dr. Solomons has found difficulty in fitting his cases into the types commonly described as primary and secondary, and in explaining the causes of these types, or as he says, "in determining whether there is anything outside the uterus making it inert." We doubt whether his vague conceptions of the primary form as being due to weak nerve-impulse, weak muscle, or hormonic cause will be found helpful. From the wide prevalence of rickets in Dublin, it follows that the chapter on pelvic disproportion is complete and practical and full of sound clinical experience. The Cæsarean section operation, much too often performed by those without adequate knowledge of alternative procedures, is here put into its proper place, and for conditions other than pelvic disproportion its adoption is also strictly limited. It has been wholly abandoned for accidental hæmorrhage, and is rarely used in placenta prævia.

Dr. Solomons disdains the dicta of tradition and authority if they do not accord with his clinical experience, but is at times himself dogmatic—no fault in a teacher. Thus, though its character has been somewhat changed, this work is as interesting as it ever was and fully maintains its individual distinction. It is a remarkable tribute to the great hospital whose methods are given deservedly wide prominence in its pages.

Elementary Hygiene for Nurses.

Fourth edition. By H. C. R. Darling, M.D. Lond., F.R.C.S. Eng., Surgeon, Coast Hospital, and Lidcombe State Hospital, Sydney, N.S.W. London: J. and A. Churchill. 1929. Pp. 292. 5s.

Apart from the title and the statement in the original preface that "this work is primarily addressed to nurses," there is little about it to indicate its special suitability for nurses reading for their final examination. The book is not in any way confined to the principles of hygiene or written in simple language, and the matter is largely similar to that contained in public health text-books designed for medical graduates studying for the diploma of public health. The fact that so much has been compressed into a small space does not make for clarity, and, indeed, causes the matter to be more difficult of digestion than that contained in the larger text-books, which have more space for explanation.

Parasitology.

Travaux pratiques de parasitologie. By E. Brumpt and Neveu-Lemaire. Paris: Masson et Cie. 1929. Pp. 302. With 202 figures. Fr.30.

The importance of parasitology increases each year, and it is becoming more and more obvious that extensive practical instruction should be an integral part of every student's curriculum. Several excellent text-books on the theoretical aspect of the subject exist—notably one by Prof. E. Brumpt, of Paris. The need for a practical text-book on the subject has now been met by Brumpt and Neveu-Lemaire of the Department of Parasitology of the Paris Faculty of Medicine. In some 300 pages they cover the ground necessary for such a course, dealing not only with the parasites proper, but also with medical entomology, mycology, and with the zoological aspects of the various intermediate hosts. The book is well conceived, well written, and fully illustrated, and should prove an excellent and reliable companion to every student of the subject.

Catalytic Processes in Applied Chemistry.

By T. P. Hilditch, D.Sc., F.I.C., Professor of Industrial Chemistry in the University of Liverpool. London: Chapman and Hall, Ltd. 1929. Pp. 360. 16s.

One of the outstanding modern tendencies in manufacturing chemistry is the increased attention being paid to the development of catalytic processes. This book is addressed to those already acquainted with one or more phases of catalyst technology, and to others who may desire to apply catalytic action to manufacturing problems in which it has not previously been employed. The book is divided into four sections, dealing with the general principles of catalytic action, catalysis at the surface of solid inorganic materials, catalysis at surface of colloidal organic compounds—i.e., fermentations—and homogeneous catalysis in liquid systems. This method of classification enables the author to create order out of chaos and to cover successfully a very large range of widely differing processes. The style is throughout clear and interesting and reveals a detailed knowledge of the processes described.

THE LANCET.

LONDON: SATURDAY, APRIL 20, 1929.

CONDITIONED REFLEXES.

ONLY in the last year or two has the work of Prof. IVAN PAVLOV, of Leningrad, aroused that widespread physiological and general interest which its remarkable character deserves. For the major part of his long lifetime he has, with singular constancy, devoted himself to the study of problems arising from the curious phenomena of what he terms the "conditioned reflex," but his published contributions have been, with few exceptions, restricted to the Russian language. It is therefore a matter of importance for the English reader to have in his hands a complete reprint of all these papers, excellently translated, of which the first is dated 1903, and the last (of 41) 1928. Moreover, the translator, Dr. HORSLEY GANTT, gives us a biographical sketch of the veteran physiologist which brings the man before us in graphic fashion and enables us to understand better his single-minded enthusiasm for the child of his brain. For it can scarcely be questioned that the association of PAVLOV with conditioned reflexes will remain as historical a combination as that of DARWIN and evolution.

With the assistance of something like one hundred collaborators in the course of these fruitful years, uninterrupted even by war and revolution, Prof. PAVLOV has probed ever deeper into the problems of cerebral function, and is at length in a position not only to add materially to knowledge of neural mechanisms, but to throw much-needed physiological light on the nature of not a few processes commonly considered to be essentially psychical. His results have been obtained by strictly objective methods, the subjective factor being completely eliminated by a technique the details of which are almost as fascinating as their application. For a basis two varieties of reflex have been utilised—the unconditional and the conditional. The former is innate, permanent, invariable; that employed throughout (the dog being the experimental animal) is the salivary reflex—viz., when the buccal cavity is stimulated by the insertion either of food or of acid, a reflex flow of saliva occurs, which can be measured with exactitude. Now a similar secretion can be readily excited if food is merely shown to the animal; the salivary centres can be reached by extrinsic stimuli of a visual kind; and if food is administered at the same time as a stimulus of still another kind—for example, auditory or cutaneous—then by dint of sufficient repetition these stimuli in their turn will evoke the salivary reflex by themselves. That is to say, properties which bear no direct relation whatever to the physiological rôle of the saliva can be made to act as stimuli—for example, form, colour, tactile and painful sensations. Excitations of this kind are dependent on a number of conditions, and are described as "conditional," or, more usually, "conditioned." The reflex which they elicit is a "conditioned" reflex; it is temporary, acquired, and modifiable. By numerous experiments Prof. PAVLOV has proved that the locus of conditioned reflexes is cerebral; for their appearance integrity of the cerebral hemispheres is a sine qua non. Any stimulus of any kind (and their number is legion) can be utilised for the purpose; it can be made into a signal, and from its receptor centre there must evidently be an open physiological path to the salivary nuclei. If eye, ear, nose, or skin is affected by any imaginable phenomenon of an excitatory kind, this can be turned into a conditioned stimulus and can arouse a conditioned reflex. And these statements are to be taken literally; the experimenter's voice, accents, appearance, clothes, his handling of the animal, his touches, caresses, the sound of his step, his *parfume humaine* (in one striking instance his garments by themselves)—one and all form the material for conditioned salivary secretion. "He" is, in point of physiological fact, an external synthetic stimulus. On this ground alone, although also on others, it may justifiably be claimed that a series of stimuli commonly thought to be of a psychical order act precisely and invariably, under conditions, as do intrinsic physiological stimuli.

In the higher parts of the nervous system, then, there exists a potentiality for temporary coupling of conduction paths, a universality of possible connexions, which serves to illumine cerebral function in an impressive way. Evidently these possibilities are infinite; according to JUDSON HERRICK, the number of possible connexions of two neurones in the human brain is $10^{2,783,000}$. There can be no end to conditioned reflexes, which means, in other words, that the human brain is never at an end; probably no one ever uses anything else than a fraction of his cerebral endowment. It is an organ of immense plasticity, capable of new acquisitions, even if temporary, as long as it lives. A corollary of this modifiability must be that there is comparatively little of the cerebral cortex that is organised, and in which specific centres can be placed. While Prof. PAVLOV accepts an anatomical cortical site for the receptive fields of the senses, and though he certainly regards the cortex as a mosaic of function, he does not overlook the implication of his experiments in so far as they demonstrate possibilities of compensation and substitution. For him, that function is constituted by stimulation and inhibition, and by irradiation or, alternatively, by concentration, of each of these; there is nothing else. He has found no trace of any "higher" function; and he reduces the complexities of the most elaborate cerebration or mentation to combinations of conditioned reflexes. He speaks of the reflex of "freedom," of "purpose," of "slavery," of "defence," of "collecting," of "sleep," nay, of "life" itself. Nor is this a mere *façon de parler*; it is a legitimate inference from the behaviour of his animals under the strictest scientific technique in the experimental room. The dog, by means of his cerebrum and its sense centres (or "analysers") decomposes the whole complexity of the external world into its units; he uses a synthesising mechanism and an analysing mechanism. Thus he makes a perfect adjustment, ensures a perfect equilibration, and there is every reason to believe man does the same. Training, education, habits, orientations in the external world, with all its events, natural and social—what are these in the last resort but either a formation of new connexions, or a superfine analysis?

Of the many-sided nature of Prof. PAVLOV's general conclusions the reader will soon convince himself. It is already widely recognised that he has explained the phenomenon of sleep in a manner more consonant with the facts than any previous hypothesis. Sleep is nothing else than internal inhibition; a stimulus which ordinarily awakens a conditioned reflex of salivary flow can by repetition under appropriate circumstances bring about reflex inhibition, and sleep ensues. Sleep can be produced at any time, infallibly, by conditioned technique. If the internal inhibition is confined to the motor cortex, the clinical condition of the animal is one of catalepsy; it is hypnotised. In the latest adaptation of his laboratory methods Prof. Pavlov's operator is in one room while the animal is in another. All that is requisite is to set the machinery in motion; stimuli, invisible and inaudible to the experimenter, are repeated mechanically; at the end of the experiment he goes into the animal room and there is the dog, fast asleep. Possibly still more remarkable are the results of investigation in regard to what most people would call animal psychology, a term which the Russian physiologist discards as otiose. Studying the whole behaviour of the dog, as expressed in synthesis and analysis, he finds that three general classes or types of animal can be distinguished. In the first, irradiation of excitation takes place with facility and regularity; in a second, irradiation of inhibition is always pronounced; in a third, the two processes are more evenly balanced. The animal of the first group is of a choleric temperament, while the second is melancholic; the third group is divisible into two subgroups, representing the sanguine and phlegmatic temperaments respectively. Is all this somewhat speculative and far-fetched? we may ask with perhaps a little impatience. The answer is that it is possible actually to produce neurotic manifestations in the dogs of the first two classes, and Prof. Pavlov gives us all the details of his method. This consists, briefly, in causing conflict among conditioned stimuli and conditioned reflexes. Take a dog of excitatory type, in which inhibition is always weak; apply two stimuli, one immediately upon the other, differing slightly from each other but so arranged that they collide, as it were; then at once, or after a few repetitions, the dog becomes positively ill. He retains only excitatory processes; the normal relation between excitation and inhibition has disappeared; the animal "breaks down" nervously, and often remains so for months at a time. It is a serious illness, for which treatment is necessary. Similar but opposite circumstances occur in the case of the group with predominance of inhibition. But the normal animal can be experimented with along the same lines without any untoward effect. He must be unimaginative indeed who fails to realise the import of these physiological experiences of the laboratory for the clinical problems of the psychopathologist and neurologist.

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SURGERY OF THE CHEST.

The increasing success that is attending surgical operations on the thoracic cavity, so admirably described by Dr. R. A. Young in his masterly review of the subject in the Lumleian lectures, concluded in our present issue, may make us wonder why this branch of surgery has remained so long undeveloped. We may experience still more surprise when we realise that Sir William Macewen, in 1895, removed the whole of one lung for advanced tuberculous disease, and that the patient survived and was alive 18 years afterwards. The reason may well be that the delicately coördinated, highly organised team-work described by Dr. Young is essential to success. Without it sporadic, perhaps fortuitous, successes will occur but steady advance will never be made. The mortality will inevitably remain too high to encourage the physician or general practitioner to call in the aid of the surgeon. The component parts of such a team are these: a physician who is truly expert in chest diseases, with a mind critically receptive of any fertile suggestions for improvement in the technique of treatment; a surgeon who is not only master of a skilful and gentle technique but who can appreciate the medical aspect of the case, who will give painstaking attention to every detail, and is willing to learn by the experience of those who have already trod the thorny path of the pioneer; an anæsthetist who understands the special problems of thoracic surgery; sisters and nurses who are highly trained, observant, sympathetic, and who realise the importance of conscientious and continuous nursing; and an expert assistant. Another essential factor in such a team is that its members should remain associated together for some time and should not be continually changing. Such a team is not so easily formed in this country perhaps as elsewhere, and it may make us wonder whether the newer fashion of frequent changes amongst hospital sisters is so helpful as the older régime, where, though the sister might develop into something of a tyrant, she was certainly a highly skilled person. A physician without imagination, and whose scepticism has been heightened by contact with indifferent surgeons, may effectively hinder progress by refusing to consider surgical treatment. A surgeon and an anæsthetist who fail to learn from the experience of others will do the same. The pioneer work has been done. Experience has been gained at the expense of a high mortality, justified because the conditions were desperate. But there cannot be many little pioneers burgeoning in many parts, all working out their own salvation. Details such as the perfect adhesion of the pleural layers in certain cases of thoracotomy, the temperature of the operating theatre, the decision to operate in one or more stages, the choice of the mode of anæsthesia, will turn the scale between a successful and a fatal issue.

The advance in both diagnosis and treatment of diseases of the chest in the last two decades is remarkable. It is but a few years since Jacobaeus published his paper on thoracoscopy, in which he described a series of cases of innocent intrathoracic tumours, several of which were successfully removed by Einar Key. Not only did his paper stimulate work on this subject, but it raised again the possibility of successfully removing malignant tumours. As Dr. Young points out, there are many difficulties, whether technical or inherent in the morbid anatomy of the chest, but enough has been achieved to enable us to hope that new routes of approach may be discovered, and that tumours may be recognised at an operable stage. Even where removal is not possible, it is to be hoped that a path may be found for the effective application of radium. Dr. Young has compressed into his series of lectures a well-nigh incredible amount of valuable information, enriched by observations from his own mature experience. Their peculiar value is that there is scarcely a word that will meet with dissent from any expert worker on diseases of the chest throughout the world. They will, we trust, be read and inwardly digested by every medical man who has patients under his care. The present unsatisfactory state of the treatment of bronchiectasis is indicated, and yet enough is said to suggest the lines on which ultimate success may be achieved. The lecturer's summary of the treatment of empyema is admirable; from the oceans of literature on the subject Dr. Young has succeeded in extracting the pearls. Such knowledge still needs wide dissemination. Many of the accepted beliefs in the profession at large on the subject of empyema are hazy and erroneous. How many know exactly when an empyema should be tapped, when a rib should be resected, and when not? In pulmonary tuberculosis, how many practitioners are able to discern when a case is passing beyond the aid of ordinary measures, and when so passing what is the right course to adopt? The review given in the Lumleian lectures cannot fail to increase the knowledge of what may be achieved by thoracic surgery and materially to assist in its evolution.

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THE SAVING OF THE CRIPPLE.

In no phase, perhaps, of preventive medicine has progress been so rapid and effective as in the treatment and cure of crippling in children. The story of the recent change in the public attitude towards the cripple from one of fear and repugnance, existing from earliest times when the deformed were persecuted as possessed of the devil, through a period of grudging tolerance of suffering and deformity as a necessary evil, to the modern standpoint that most of the crippling can be avoided, is told by Sir Henry Gauvain and Dr. Evelyn Holmes in a paper whose publication we conclude this week. This change of attitude has been brought about by the devoted services of a few lay and medical pioneers, including Mrs. Humphry Ward, Mrs. C. W. Kimmins, Sir William Treloar, Sir Henry Gauvain, and Sir Robert Jones. The lay workers established schools where the personality and character of the sufferer was allowed to develop along normal lines in a somewhat sheltered communal environment, while the medical men proved how unsatisfactory was the so-called radical treatment in comparison with the conservative methods now relied on to prevent the disastrous consequences of crippling diseases.

Official recognition of the special needs of crippled children has but slowly followed in the trail of these leaders; perhaps necessarily so, since no public body dare spend money until public opinion is assured that expenditure is justified. Now, however, the lag of indifference and laissez-faire is being overtaken. The best aspects of sporadic, voluntary, and official methods are being coördinated to deal with this mass of needless suffering; schemes for orthopædic treatment, embracing the work of private practitioners, medical officers, consultants, and voluntary bodies are springing up all over the country, and new methods and a broader national outlook are moulding and forming a policy which promises to prevent, as Sir Henry Gauvain and Dr. Holmes estimate, between 70 and 90 per cent. of the amount of disability now occurring. Certainly the elementary school child has the promise of greater and ever greater facilities for effective medical supervision, prevention, and treatment, but Sir Henry does well to draw attention to the needs of children of the secondary and public school classes in our nascent schemes for dealing with crippling. There are at present no means whereby crippled children from well-to-do homes—even with considerable outlay—can benefit by prolonged hospital school treatment, comparable with that available for the State-aided child. True, some 70 per cent. of crippling is found among the poorer strata of society, but this still leaves 30 per cent. among the other classes who cannot have prolonged treatment of the right sort. The average length of stay in hospital schools to ensure quiescence and stabilisation is perhaps two years, during which time not only specialised medical treatment but education along the right lines is essential. This period of more or less active therapy is properly followed by daily attendance at special physically defective schools where effective medical and nursing supervision is continued, if necessary until the child is 16 years of age, whilst his later progress may also need to be watched in special cases. No such facilities, however, exist for other than State-aided children. We know that untreated physical defects by excluding children from the corporate life of their fellows often lead to a sense of inferiority and to social inefficiency, and Sir Henry Gauvain and Dr. Holmes are right in expecting the support of the medical profession when they say that we have here a state of affairs that must be remedied.

In his wise conception of the needs of the body Sir Henry has from the first appreciated the necessity of tending the mind by suitable education, not alone to supply the immediate requirements of interest and happiness that help to maintain or restore health, but also to supply knowledge, and the means and ways of applying knowledge and of adaptation when the child later takes his place in the industrial world. In acute illness rest is essential, both of body and mind, and the question of occupying the mind does not enter into the scheme of general hospital treatment. But during convalescence from acute illness, such as rheumatic fever, or in the long periods required in treating the cripple, a cheerfully occupied mind is of the first importance. All convalescent and other hospitals taking patients of this kind should therefore have educational facilities as a fundamental part of their equipment, the educational side being part of the medical treatment and under the direct supervision of the medical man. Sir Henry says that nearly 1 per cent. of all elementary school-children need treatment and special education for crippling defects—i.e., between 30,000 and 60,000—and if we add some 10,000 children not of the elementary school type we get an idea of what has to be done. The age of onset of crippling, other than that of the heart, falls predominantly in the pre-school era, and there are indeed many who believe that the seeds of rheumatic heart disease are also sown before school age. Over and above this the school medical service has shown that some 30 to 40 per cent. of school entrants suffer from minor defects. All this clearly indicates how great is the need for an effective medical supervision of the pre-school child, and it is not unlikely that the next big step forward in preventive medicine so far as the poorer classes are concerned will be an extension of maternity and child welfare schemes to embrace all children from conception to the school age. The growing momentum of combined social and medical preventive work must be clearly recognised, but the task of resolving these forces along satisfactory lines is not one that can be attempted by anything less than a united professional opinion.

Pathological Research in its Relation to Medicine.—A course of lectures on this subject will be given at the Institute of Pathology and Research, St. Mary's Hospital, London, W., on Thursday afternoons, at 5 P.M., from April 25th to June 13th inclusive. The lecturers will be Sir Almroth Wright, F.R.S., on the Experimental Method in Medicine (April 25th); Prof. Ariens Kappers, of Amsterdam, on the Phylogenetic Development of the Protopathic and Epicritic Centres in the Central Nervous System (May 2nd); Dr. E. D. Adrian, F.R.S., on the Nervous Mechanism of Sensation and Movement (May 9th); Prof. F. T. G. Hobday on the Value of Research into Animal Diseases as an Aid to the Study of the Diseases of Man (May 16th); Prof. W. W. C. Topley on the Natural Acquirement of Immunity (May 23rd); Prof. F. W. Twort, F.R.S., on the Position of Ultra-microscopic Viruses in the Living World (May 30th); Prof. William Bulloch, F.R.S., on the History of Bacteriology (June 6th); and Prof. J. A. Gunn on Variations in Susceptibility to Drugs and Toxins (June 13th). These lectures are open to all members of the medical profession and to all students in medical schools without fee.

Annotations.

"Ne quid nimis."

THE KING.

WE published in THE LANCET of April 6th the official bulletin issued from Craigweil House on March 29th. Another bulletin was issued from the same residence on Sunday, April 14th, as follows: "His Majesty the King continues to make satisfactory progress, and the rheumatism of the right shoulder is yielding to treatment." The bulletin was signed by Sir Stanley Hewett and Lord Dawson of Penn.

THE LOCAL GOVERNMENT ACT.

As a forerunner of the detailed memoranda to be issued to local authorities on the different parts of the new Local Government Act, the Minister of Health has promulgated a general introductory circular, from which extracts are printed on p. 841 of this issue. The circular summarises with remarkable lucidity the principles of the new law; it sets out the defects of our present system, and it names the remedies which the Act provides. It explains the transfer of the functions of poor-law authorities to the councils of counties and county boroughs, the readjustment of the cost of roads, the proposed survey of the areas of county districts, the derating arrangements, and the distribution of consolidated grants according to the needs of the areas concerned. While drawing attention to the actual administrative and financial changes in prospect, the Minister takes this early opportunity of emphasising the importance of the spirit in which the Act is operated; he asks for the fullest collaboration from local authorities, their officers, and the general public in the task of developing a scheme of sound local government, and particularly the protection and improvement of the health of the people. The Local Government Bill, which received the Royal Assent before the Easter adjournment, had a fairly smooth passage through Parliament. Based on past recommendations to which members of all parties had committed themselves, advocated in the House of Commons with masterly skill and team-work, its principles were but little shaken by political opponents. But there are still difficult days ahead. Duties cannot be taken from hands which have discharged them with pride and fidelity, nor can the traditional boundaries of the English countryside be altered, without umbrage and irritation. There is no need to take notice of the facile and unworthy criticism of those who, themselves shirking the necessary study, protested that the proposals were too complicated to be commended to modern democracy. The Act is now upon the statute book, and the citizens to whom its administration will be confided can examine it before its main provisions take effect in April next year. Evidently the Ministry will give all possible assistance, though at this point two observations may perhaps be permitted. The first is that departmental memoranda are not a complete substitute for the actual text of the statute; even if the week-end of Easter intervened, it is disappointing that an important Act of Parliament passed on March 27th should be still unpublished more than a fortnight later. The second is that the Minister can earn the gratitude of all medical officers of health and members of local authorities if he will set the official draftsmen (who will have unusual leisure in the next few months) to work on the re-statement of our local government enactments in an orderly code. The consolidation of those enactments involves neither political controversy nor a charge on the public purse. They were notoriously in a tangle before; their state is far worse now.

GLAUCOMA SECONDARY TO IRITIS.

CASES of iritis or irido-cyclitis which develop high tension are among the most difficult that the practitioner has to encounter. On the one hand, an eye with raised tension is glaucomatous, and the first thing to be done in cases of glaucoma is to instil eserine. On the other hand, the remedy for iritis is atropine, and eserine is distinctly harmful. What, then, should be done? At a discussion on the causes and treatment of irido-cyclitis with raised tension at the 1928 Congress of the Ophthalmological Society (the report[1] of which appears in advance of the present Congress) three types of cases were distinguished by Mr. W. H. McMullen. In the first type increase of tension occurs soon after the onset of acute inflammation. In these cases there are usually abundant keratic precipitates and the anterior chamber is usually deep, or at any rate not shallow as in primary acute glaucoma. Some authorities have advocated the use of miotics in these cases, but the weight of opinion is decidedly against them and in favour of pushing atropine as in ordinary cases of acute iritis. Atropine keeps both iris and ciliary muscle at rest and it prevents the formation of synechiæ. To combat the inflammation is the best means of preventing the increase of tension due to it. If, however, the tension does not come down, and especially in cases where the anterior chamber is shallow, the difficulties of deciding on the line of treatment are great. In proportion as the case approaches in character to one of primary glaucoma the temptation to use eserine becomes strong. Mr. Harrison Butler, while advocating the pushing of atropine in these cases—the higher the tension the more he would push it—admitted that in some cases this would not do. In some doubtful cases he used homatropin alternating with pilocarpine, by which method he avoided adhesions and yet prevented the iris from bunching up in the angle of the anterior chamber, mechanically raising the tension. The question of operation was discussed but it was generally agreed that with acute irido-cyclitis it should, if possible, be avoided. Iridectomy, involving trauma of a structure in a state of acute inflammation, is obviously contraindicated. Trephining is liable to be followed by blocking of the trephine hole by exudation. The simplest procedure is the best, but tapping the anterior chamber by paracentesis has only a very temporary effect and it may not be feasible to repeat it many times. Some form of sclerotomy is probably the safest procedure in case of necessity, and some surgeons speak well of Herbert's "small flap sclerotomy." It is impossible to lay down any general rule for these cases, each of which must be judged on its own merits. For the general practitioner the chief moral is the necessity of being able to distinguish between primary and secondary glaucoma, so as to make no mistake in taking the emergency measures called for when a specialist cannot at once be consulted.

Mr. McMullen's second type of cases comprises those resembling acute or subacute glaucoma in which careful examination reveals signs of uveal inflammation. These differ from the first type in that the signs of iritis or cyclitis are not nearly so obvious or so severe. The keratic precipitates may be so slight that they can only be detected by the slit-lamp. In these cases, to quote Mr. McMullen, "it is probable that the irido-cyclitis is not the essential factor but that we have to deal with eyes that were predisposed to glaucoma by anatomical or other changes, eyes in which the mechanism for regulation of pressure allowed a very small margin of safety, and that the occurrence of a slight irido-cyclitis upset the delicate balance and determined the onset of glaucoma." Indeed, these cases approximate to true glaucoma, and before the general use of the slit-lamp and corneal microscope passed as such. It has even been asserted that most cases of so-called primary glaucoma are really of this type, but here there is the possibility of a fallacy. According to Mr. Harrison Butler, in the case of pigmentary deposits on the back of the cornea so minute that they can only be seen with the slit-lamp, these are not necessarily the results of an inflammatory process, for in elderly people the pigment round the pupil margin tends to become free as the result of a senile degenerative process and being deposited on Descemet's membrane may simulate true "K.P." In his opinion the majority of doubtful cases turn out to be primary glaucoma. In general we may say that the objections to treating this second type of cases as true glaucoma are much less valid, and operation is generally called for, either iridectomy or sclerectomy.

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[1] Transactions, vol. xlviii., pp. 45–82.

Cases of the third of Mr. McMullen's types are those of chronic irido-cyclitis in which increase of intra-ocular pressure occurs months or years after the onset of obvious inflammation. When it is long continued nothing but operation is likely to relieve it permanently. In the absence of an acute attack iridectomy may have a favourable affect on the irido-cyclitis, and this combined with some procedure which will result in a filtering cicatrix is generally indicated. In chronic or subacute cases where there is time to investigate the possible causes underlying the condition and especially any form of septic infection, the effective removal of such causes must naturally take precedence over other treatment.

LEPROSY IN AUSTRALIA.

A NOTEWORTHY contribution to the epidemiology of leprosy has been made by Dr. Cecil Cook,[1] Wandsworth Research Scholar of the London School of Tropical Medicine, and appears opportunely at the opening of a campaign for the elimination of leprosy from the British Empire within a generation. To quote the prefatory words of Dr. J. H. L. Cumpston, Director-General of Health: "This volume presents for the first time a complete record of the known facts relating to leprosy in Australia."

Among the many problems confronting Dr. Cook was the variable behaviour of the disease in different parts of the continent. For example, why does leprosy attack the white population of New South Wales and not that of Victoria? Why does the legislation, which is effective in controlling the disease in New South Wales, fail to prevent an actual increase in prevalence in Queensland? Again, the difficulty in tracing case-to-case infection led Ashburton Thompson to the conclusion that in New South Wales the evidence pointed to the probability "that the infection of leprosy is received by man from his environment rather than from the sick." Dr. Cook carried out his investigations during the years 1923–25 and, for the purpose of studying local conditions in endemic areas, examining relatives of patients and making a leprosy survey of territory hitherto overlooked, he travelled about 15,000 miles by motor, several thousand miles by rail and steamer, and some hundreds on horseback. He deals in separate chapters with leprosy in the Northern Territory, Western Australia, Queensland, New South Wales, and Victoria. His account of the origin of outbreaks of leprosy will be convincing to most of his readers. There was no leprosy, he says, amongst the aborigines before the white settlement of the continent, but the disease was not introduced by the whites. During the gold-rushes of the sixth decade of the nineteenth century there was a large influx of Chinese labourers, and about a decade later of Polynesians, and amongst the immigrants of both races there were many lepers. These immigrants consorted with the aboriginal women and the tribes of aborigines in due course became infected. In the early days each tribe kept to itself but the gradual removal of intertribal restrictions facilitated the spread of infection. The pioneer white population were males only and a decade or two later the disease spread to them owing to cohabitation with infected aborigines. There was no sufficiently intimate contact between the infected aliens and the whites to provide for direct transmission of infection. The aboriginal women filled the rôle of intermediary; the whites were infected a decade or two later than the aborigines and the first whites infected were adult males. When the pioneer white communities were replaced by families, the white infection became domesticated, as in New South Wales. The early disappearance of the aborigines from Victoria to the northern regions removed the intermediary link but the original method of infection is still operative in the north. The increasing prevalence in Queensland is, he considers, attributable to unrecorded cases, unsuspected undiagnosed cases, and concealed cases. In the early days the medical men were unfamiliar with the disease and it has often been regarded as syphilis.

In the course of his report Dr. Cook goes fully into the possible ways in which the disease is spread. Hereditary infection he regards as untenable, although the history of certain families cited may suggest the transmission of a predisposition. Environment per se is powerless but if human infection is introduced it seems to spread more easily in humid coastal regions than in dry inland areas. Moreover, the form of the disease prevalent among the whites —though not the aborigines—in the dry inland districts is the neural non-infective type. Dr. Cook's investigations do not lead him to attach importance to the effect of biting insects or to the possibility of true insect vectors. The bed-bug is absolved. While admitting that there is a prima facie case for the transmission of leprosy to man from the rat by the agency of *Xenopsylla cheopis*, he points out that the conditions of life among the aborigines do not favour this means of transmission. He sums up Australian experience by saying that "where infection has not been domestic, the commonest indication is infection from aborigines under circumstances provoking contact of the most intimate nature—cohabitation and sexual promiscuity." He draws the conclusion that leprosy "should be readily eradicated by a system of prophylaxis which ensures that lepers shall have no opportunity of associating closely with uninfected persons," and goes on to emphasise the weak points in the present system, including the lack of inter-State coöperation.

THE COMMON COLD AND ULTRA-VIOLET LIGHT.

THE sufferer from frequent heavy colds is a miserable creature. He gets little sympathy from friends whose experience of colds amounts to no more than a couple of days' discomfort; his employer will allow no sick leave for a "mere cold"; his relatives shun him for fear of infection; his doctor has nothing to suggest save time-honoured palliatives that scarcely palliate; and his Minister of Health execrates him for going about the world spreading germs. Meanwhile he is struggling to carry on while feeling really ill for about a week, and he is likely to be "run down" for the best part of a month afterwards. The cold is a difficult thing to study statistically, but a college group offers a good field for investigation, and the department of hygiene at Cornell University has realised the possibility of reducing the catarrhal chaos to some kind of order by observing the students in residence. Dr. D. F. Smiley,[1] who records some of his findings among 2485 students of both sexes, says that there seemed to be a definite group of people (rather less than 20 per cent.) immune to colds, and another group (rather more than 20 per cent.) seriously susceptible in that they had four or more every year. A graph shows that it is the small susceptible group who are really responsible for the winter epidemics, and Dr. Smiley believes that any measure which would control the colds of the few who have more than four a year might very well eradicate the big epidemics which cause so much loss of time and endanger so many lives. He was unable to find any difference in the general physique or physical make-up to distinguish the cold-susceptibles, but their history showed a greater liability to asthma, hay fever, and infectious disease. Smoking, mouth-breathing, sleep- and exercise- habits, clothing, exposure to draughts, tendency to perspiration, family history, and the use of a daily cold bath, could—according to the Cornell figures—all be discounted as ætiological factors in the "cold diathesis." There was, therefore, nothing to guide prophylaxis. Previous experiments had convinced Dr. Smiley and Dr. G. H. Maughan that there was a definite reciprocal relationship between the incidence of acute respiratory infections and the average daily hours of sunshine, and it occurred to them that there might be some vitamin deficiency or disorder of vitamin metabolism during the dark months of the year which would lower the resistance of the human body to cold-producing organisms. On this hypothesis 23 of the sensitive Cornell students were irradiated weekly with a quartz mercury-vapour lamp, a control group receiving no treatment. The dosage was small, as the investigators thought it had been excessive in previous experiments where results had been negative. The average number of colds for the autumn term was 1·56 for the irradiated students and 2·80 for the untreated, the figures being 1·24 and 2·79 respectively in the second term. Smiley and Maughan are conservative in their claims, but suggest that their results justify the use of short weekly irradiations with ultra-violet light in cases of marked susceptibility to colds where even a 40 per cent. decrease in incidence would be welcome. Much larger series will be required to convince the sceptic, but this contribution may be regarded as supporting the people who believe that they are saved from winters of misery by systematic irradiation or by immediate exposure for a few minutes as soon as the premonitory symptoms of the dreaded cold are experienced.

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[1] Service Publication No. 38. Australian Ministry of Health. Canberra.

[1] Amer. Jour. of Hyg., March, 1929, p. 466.

THE CENTENARY OF BILLROTH.

LAST week the profession in Germany and Austria celebrated the centenary of one of the outstanding personalities in the medical history of the nineteenth century.[1] Theodor Billroth was born on April 26th, 1829. He was a great surgeon, perhaps the greatest of his time, but what distinguished him more than any one attainment or quality was his possession in equal measure of those gifts which capture the heart and imagination. Besides his surgery he had an exhaustive experimental knowledge of anatomy and histology; his work on wound infections made him a pioneer of bacteriology; he was a good musician and composer, and he enjoyed 40 years of successful married life. A man of robust figure and dominant personality, strikingly expressed in his flowing beard and piercing eyes and in the voluminous cloak and broad-brimmed hat which he habitually wore, he was a source of inspiration to hundreds of colleagues and students and to thousands of patients. He was a pioneer in many more ways than in research. He decisively rejected the forbidding bedside manner which too many of his countrymen regarded as an indispensable professional adjunct, and devoted himself to encouraging his patients before their operations and putting forth every effort to restore them afterwards to the best possible state of mind and body. His relations with his patients gave him an almost superhuman reputation, and sufferers used to drag themselves hundreds of miles to his clinic in the hope that he would cure them when every other surgeon had given them up. Their attitude was expressed in the pathetic exclamation of a mortally wounded Prussian officer when Billroth walked into the ward: "Thank God! Now I'm saved." One of his greatest services to German surgery was his instant acclamation of Lister's discovery. He sent his assistant to Edinburgh to learn the new methods at first hand, and introduced them with relentless firmness into his hospitals. He was a great writer and a great teacher, and held many famous chairs, but in 1867 he went to Vienna, which so enthralled him that even the offer of his old master Langenbeck's place could not tempt him back to Berlin. A witty contemporary said: "Austria could not have taken a finer revenge for Sadowa than to annex the best thing Prussia possessed." In spite of a critical attack of pneumonia in 1887 he lived to celebrate his twenty-fifth year as professor of surgery in Vienna, but shortly afterwards it became obvious that his heart was failing. Strength of will enabled him to remain in harness almost to the end, but towards the end of 1893 he had to retire to the Albazia, the hospital for which he had such a strong affection and which he had practically made his own, and in February of 1894 he died. The enthusiasm with which his centenary is being celebrated testifies to the universal admiration which he inspired. His unique value lay not so much in what he did as what he was.

THE REPORT ON RADIUM.

ON March 25th, as was reported in THE LANCET at the time, Lieut.-Commander Kenworthy asked the Minister of Health whether he had received the report of the Subcommittee of the Committee of Civil Research on radium and radium supplies; and whether it was proposed to publish it in whole or in part. Sir Kingsley Wood replied: "The report has been received and will be published in full very shortly. I may add that a statement of the intentions of the Government in the matter will be made immediately on the reassembling of Parliament." It is an open secret that this announcement was received with mixed feelings by members of the medical profession, who cannot have expected that the intentions of the Government would be formulated as a result of a report the contents of which was a complete secret to them until this week, while the personnel of the authors of the report had not been made really public. Undoubtedly the presumption was that the report, in the composition of which no representatives of clinical medicine appear to have been consulted, would be submitted for deliberation, at any rate, to a duly selected list of professional leaders before Parliament was invited to act upon it, for action must be taken to follow upon intention. On Tuesday last, however, the announcement was made by the Chancellor of the Exchequer that the Government had decided to contribute £1 for £1 raised by public effort to obtain a sum of £200,000 to be expended in the purchase of radium, the employment of which, presumably will follow the lines of the report of the Subcommittee, and on Wednesday the report became available for the public. Before the public is asked to assist in the raising of a purchase fund, there ought of course to be no question as to whether the members of the medical profession, as trustees for the proper therapeutic uses of radium, are properly satisfied as to the husbanding and allocation of the supply of radium, when obtained.

A summary of the report is published in another column, and it will be seen that the Subcommittee have covered the ground very thoroughly. The growing importance of radium as a therapeutic agent is clearly explained, and the fact emerges that since systematic studies of a comprehensive character have been undertaken in regard to the biological and curative properties of radium, the possibilities of radium surgery have been recognised to the great benefit of the world. Hence the need for obtaining a stock of radium is pressing, while an analysis of the existing supply for medical treatment in this country shows a very definite shortage. The amount of radium at present required for medical purposes in England, Scotland and Wales is calculated as being 49 g., of which it would seem 24 g. only are in our possession. The basic recommendation of the

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[1] Wien. klin. Woch., April 11th, p. 457.

Subcommittee is that there should be a definite aim at securing a net increase of 20 g. of radium to be available for medical purposes by the end of 1930. The market to which recourse must be had is Belgium, for the figures show that at the present time very little radium is being produced anywhere except from the Belgium Congo ore, and it is possible that the privacy in which the activities of the Subcommittee have been transacted was due to the feeling that it was important that no public surmise should influence the prices. Clearly our holding must be increased, and the proposed organisation for the distribution of a central stock of radium for medical purposes turns upon the constitution of a body of Trustees whose duty it will be to hold the funds provided by Parliament or otherwise, and to purchase therewith and hold radium for use by an expert body termed the Radium Commission; and at this point the claims of clinical medicine to be recognised are met. The National Radium Trustees include the Presidents of the two Royal Colleges, the B.M.A., and the Royal Society of Medicine, while the Radium Commission, a body of nine, will consist of four persons nominated by the Trustees, and four representatives nominated, one each by the Minister of Health, the Secretary of State for Scotland, the Medical Research Council, and the Department of Scientific and Industrial Research, with a chairman, "a distinguished public man," who, however, will not necessarily be a member of the medical profession.

Of the report of the Subcommittee there can be but one opinion—it is a clear document, packed with facts which support its recommendations. But the omission to take the medical profession into consultation before the report was made must by the members of that profession be regarded as a possible source of weakness in the future.

THE BALANCE OF POPULATION.

THE excess of live births over deaths in England and Wales during the year 1927 was only 169,503, a figure 60,000 or more below that of the three previous years. The Registrar-General, who notes this curious fact in the third part of the Statistical Review of the year which has just appeared,[1] explains the excessive drop in the natural increase of population by the conjunction of a special decrease in births and an equally fortuitous increase in deaths. The former was due largely to the abnormal decline in the number of new marriages in 1926, associated with the prolonged coal strike and the industrial disturbance of that year. The mortality of the year was not high in itself but was merely relatively so in contrast to the low record of 1926. Every cause set out in the table of causes of death shows a higher mortality for each sex in 1927 than in 1926, with the single exception of the category Old Age, a form of return which has been rapidly declining in frequency of recent years. This growing reluctance to attribute death to old age must help in some degree to account for the increase from more definite causes. Taking the various causes of death seriatim the greatest increase of 1927 as compared with 1926 is from influenza, heart disease and cancer coming next; but when comparison is made with 1921–25 the increase from influenza is naturally less outstanding, heart disease ranking first and next to it cancer. Both these rates are likely to be swollen by transfer from Old Age; heart disease as a result of the increasing record of myocardial disease on the certificates of aged persons, and cancer as a result of the increasing frequency of the disease in the old. As the Registrar-General points out, the population as a whole is gradually getting older and will continue to do so for many years to come owing to the heavy falls which have occurred in both fertility and mortality during the past half century. We must not infer, he says, that the perpetuation of current conditions of fertility and mortality will be sufficient to ensure a continuous increase in the national population.

TWO GIFTS TO LONDON CHILDREN.

DURING the past week London children have benefited by two generous and imaginative benefactions. Sir James Barrie has given all his rights in "Peter Pan" to the Hospital for Sick Children in Great Ormond-street, and it is estimated that the gift, which is wholly unconditional, will produce an income of something like £2000 a year. This generous action has already borne fruit, for "The First Pirate" has anonymously given a pound note in the hope that others may follow his example. The second benefaction is the offer by Lord Rothermere of £100,000 towards the purchase of the Foundling Hospital site, the option on which is to be kept open until June 30th, 1931, Lord Rothermere having made himself responsible for the annual interest on the remainder of the purchase money in the meantime. The fact that the Foundling site lies so near to the Children's Hospital made the proposal (now abandoned) to rebuild the hospital on this site seem a natural one, although it is perhaps still more fitting that the area should be kept open in perpetuity as a children's park, in accordance with the conditions laid down by Lord Rothermere, who has stipulated in addition that the park shall be placed for one month in each year at the disposal of the British Boy Scouts Association for a camping ground. Sir James Barrie's benefaction recalls a similar act of beneficence on the part of a great artist, for Handel left the score of "The Messiah" by will to the Foundling Hospital, and during his lifetime a sum of more than £10,000 was added to its funds by the annual performance of the Oratorio within the hospital on the great organ which he gave to it. The Foundling site will provide a large open space in a part of the metropolis which has stood greatly in need of one ever since Lamb's Conduit Fields were built over, after the governors of the Foundling Hospital had bought 55 acres of these fields from the Earl of Salisbury for a matter of £5500. The little green patches provided by squares and churchyards in the middle east of London, even if they were available for children's play, do not take the place of the wide areas of wilderness in the western districts, and those who are familiar with the way in which Clissold Park, a mile or two further north, is used by the dwellers in the further east who trek there and back on fine, summer afternoons, can form some conception of what the Foundling site when it is laid out will mean to the children of Agartown and Somerstown. If there is not room for ornamental water there will at least be playing fields and sandpits and possibly some small enclosures where bright-coloured fowl and cavies can rejoice the heart of the urban child.

INTERNATIONAL SURGICAL CONGRESS.

THE Eighth Triennial Congress of the International Society of Surgery will be held in Warsaw from July 22nd to 25th, when the following subjects will be discussed: The Causes and Mechanism of Post-operative Embolism; the Results of Resection of the Stomach for Gastric and Duodenal Ulcer; the Treatment of Exophthalmic Goitre and the Reparative Surgery of the Hip-joint. The Society has chartered a liner of the Compagnie Générale Transatlantique for the use of members; this will leave Zeebrugge on July 12th and after calling at Ymuiden, Copenhagen, Riga, Helsingfors, Stockholm, and the Island of Gothland will arrived at Danzig on July 21st. From here Warsaw is only eight hours by rail. Messrs. Thomas Cook and Son are arranging inclusive terms for the stay in Warsaw and for the journey from London for those members who do not wish to join the preliminary cruise, with an extension to Vienna, Budapest, Prague, and Leipzig after the Congress for those who desire it. As the hotel accommodation in Warsaw is understood to be limited early booking is desirable. The British delegate is Mr. J. E. H. Roberts (26, Harley-street, London, W. 1), to whom intending participants are invited to refer.

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[1] The Registrar-General's Statistical Review of England and Wales for the Year 1927. Text. H.M. Stationery Office. 1929. 5s.

THE RETURN OF SEVERE SMALL-POX.

The disembarkation from a British ship at Marseilles on March 27th of a seaman fatally ill with small-pox, and the distribution over this country of nearly 1500 possible contacts, has set the public mind again thinking of small-pox as a dangerous disease. For many months past 200–300 cases of small-pox have been notified each week from widely scattered counties in England and Wales, but only an occasional fatality has been reported, with some other contributing cause of death appearing as a rule on the death certificate. The small outbreak of 11 cases of small-pox in London two years ago, which led to six deaths, was attributed to some undisclosed case imported from abroad; and a little earlier the married couple who sickened of small-pox in its hæmorrhagic form had recently arrived from Paris. In neither of these instances was there any extension of the severe disease to the population at large, but the danger of the present situation has been accentuated by the fact that the seaman landed at Marseilles had been ill on board for ten days before the disease was recognised as small-pox, and about one-third of the passengers left the boat at Marseilles to cross France for England before any precautions had been taken to protect them from the results of possible contact. From the details given on another page it will be seen that, in spite of the extraordinary favourable opportunity offered for the development of widespread infection in a closed community on shipboard, only 42 secondary cases of small-pox have occurred, with a total to date of six deaths. All persons on board the vessel were offered vaccination or revaccination between Marseilles and Liverpool where the passengers disembarked, the crew proceeding to dock with the ship at Glasgow. At these ports the health authorities decided that the situation would be fully met by keeping them under observation during the critical period, and by the usual careful surveillance of contacts, a policy which seems to have been justified by the event. On the other hand, the health authorities in France, which relies for protection against small-pox on the principle of universal compulsory vaccination, threatened to apply this policy logically by refusing (from Thursday of this week) to admit into the country any passenger from England who was not prepared with evidence of recent vaccination. Opportunities were to be offered both on the crossing and on arrival at a French port for the traveller to comply with this regulation, while the tourist companies were to make arrangements for such through passengers as desired to avoid the regulation by travelling on the eastern side of the frontier. At the last moment the order was suspended. Recent vaccination, however, would ensure the safety of the traveller in France as well as the converse. The present position affords an interesting commentary on the need for complete international agreement as to the methods to be adopted for dealing with small-pox when, as must happen from time to time, it again presents itself in a dangerous form.

THE MICROSCOPE ON SHIPBOARD.

Dr. R. Pirot, a French surgeon lieutenant-commander, serving in China on board a gunboat of 800 tons and 110 men, tells [1] of the medical advantage he gained during his cruise from taking a microscope with him and fitting up a small laboratory on board. The diagnosis of malaria without a blood-film examination is, he truly says, impossible; clinically, the disease is often missed or identified wrongly. Again, everyone is now so anxious about venereal prophylaxis that treatment is sometimes over-active and Pirot found himself able, by examining pus-films, to decide that some chronic discharges were due to a chemical, not to a venereal, urethritis, and so to get them stopped. In other such cases, by definite recognition of the cause of very early infective discharges, he was able to start vigorous treatment at once, which without a microscope he would not have dared to do. But it was in the study of intestinal parasites he found his little laboratory most useful, as there were some 20 natives on board, of whom a third were infected with *Necator americanus*, and others with other intestinal parasites; in fact, he did 200 examinations of fæces in the year. Thus, also, he could diagnose amœbic dysentery early and begin emetine treatment forthwith, with great advantage to the patients. Altogether he did 377 examinations in the year, and wishes all to know that such a laboratory is possible even on board a small craft. Like Molière, he took his good where he could find it, wiling acetone out of the gunner, and wire (mirabile dictu) out of the wireless operator; but most of his stains came from a kindly Pasteur Institute. He is rather proud of a useful centrifuge he made out of a ventilating fan, but in his small (10 ft. by 10 ft.) laboratory, and in those climates, he must have sometimes regretted that the centrifuge was not still an electric fan. His only serious difficulty seems to have been that the ship's distilled water was not quite good enough for washing Giemsa and Romanowsky films; so, after watery eosin he stained his films with Stévenel's blue (75 c.cm. of 2 per cent. methylene-blue, and 50 c.cm. of 3 per cent. permanganate of potassium, heated together in a water-bath till the precipitate dissolved). This solution, he says, is permanent; the film need only be washed with ordinary water and gives complete differentiation to the leucocytes.

Summer Time will commence in Great Britain, Ireland, the Channel Islands, and the Isle of Man on Sunday morning next, April 21st, at 2 A.M., when the hands of timepieces should be advanced one hour. It will end on Sunday, Oct. 6th. France makes the change at the same week-end, after which travellers need not alter their watches on crossing the eastern frontier.

During the Annual Meeting of the British Medical Association in Manchester an exhibition of works of art belonging to members of the profession will be held. Medical men are earnestly invited to loan pictures and works of art, and communications in respect of the exhibition should be addressed to the chairman of the Local Entertainments Committee, 33, Cross-street, Manchester.

Royal Medical Benevolent Fund.—During the first quarter of this year £2774 has been voted in grants and £1320 paid to annuitants, these figures showing an increase on the corresponding period of last year. At the recent meeting of the committee 33 grants were made, amounting to £715. The following are short notes on four of the cases helped:—

M.D., aged 76. Sight damaged by X rays in early days of long exposures. Vision of the right eye practically gone and left eye failing. Applicant was one of the earliest workers with radiology in this country. Private income £22. Freemasons have given a pension of £64, making a total income of £86. Voted £40.

M.B., aged 72. For many years has suffered from mitral disease and during the last few months has had increasing difficulty in walking and is unable to work. His savings are being exhausted. Voted £40.

Widow, aged 62, of L.R.C.S., whose husband was a ship's surgeon until his death in February. The widow has been left with no income. Her daughter is earning £130 a year and relations contribute £50, making £180 for two persons. Fund voted £36.

Daughter, aged 61, of M.R.C.S. Her father died when applicant was a child. She was trained as a nurse and supported herself through life as nurse-matron in schools. In 1928 she had a severe operation and has had to give up work. Income, £75. Rent, £26. Fund voted £26.

Subscriptions and donations should be sent to the honorary treasurer of the Fund, at 11, Chandos-street, London, W. 1.

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[1] Arch. de Méd. Navales, 1928, cxviii, 417.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XXVIII.

THE SIGNIFICANCE OF ORGANISMS IN THE URINE.

PART II.*—IDENTIFICATION OF THE ORGANISM.

THE routine laboratory examination of a specimen of urine involves the making of stained and unstained preparations from the centrifugalised deposit, the making of cultures, and, in special circumstances, the inoculation of an animal.

Technique.

At least 10 c.cm. of the specimen is centrifugalised and the deposit used for microscopic examination. An unstained preparation serves for the identification of *pus, epithelium, red cells, casts, crystals, ova, and* motile bacteria. For stained preparations the most satisfactory techniques for routine use are Gram's and Ziehl-Neelsen's methods. In special circumstances dark-ground illumination may be used to search for the leptospira of infective jaundice; alternatively a dried preparation may be stained by Giemsa's method. For cultivation, as a routine medium a simple litmus-lactose agar gives the most useful results in that it helps to differentiate typhoidal organisms from ordinary *B. coli*. Non-lactose fermenting coliform organisms should be identified by subculturing into suitable sugar media and, if necessary, by agglutination. A serum-agar or blood-agar medium should be used where streptococci are to be cultivated. As a routine, the cultures are incubated for 24–48 hours, but in special circumstances, such as examinations for the Brucella group (melitensis, &c.) incubation should proceed for seven days before the culture is regarded as negative.

Animal Inoculation.

Guinea-pig inoculation is performed for the detection of *B. tuberculosis* when, as is frequent, the organisms are too few in number to be detected in a Ziehl-Neelsen stained film. Provided that the specimen does not contain large numbers of pyogenic bacteria the animal is inoculated direct with about 1 c.cm. of the centrifugalised deposit. When pyogenic infection is heavy, the deposit is first treated with an equal volume of 3 per cent. caustic soda for half an hour at 37° C.; at the end of this time it is made neutral to litmus, centrifugalised, and the deposit inoculated. The caustic soda kills off pyogenic bacteria but has little or no action on tubercle bacilli (Petroff's method).

Inoculations are made in the lower part of the anterior abdominal wall, and evidence of tuberculous infection is first given by enlargement of the inguinal glands. Inoculated animals are examined from week to week for loss of weight and for glandular enlargement, and if the glands become easily palpable an autopsy may be performed without further delay. If there is no sign of glandular enlargement, the animal is allowed to live for two months before an autopsy is performed. Any tuberculous lesions are examined in smears, and if necessary, in sections, for evidence of tuberculosis; a positive result is presumptive evidence that the original specimen contained tubercle bacilli. In the average case a definite result from animal inoculation takes from 6–8 weeks to obtain. A guinea-pig may also be used to demonstrate the *Leptospira icterohæmorrhagiæ* in the urine in the later stages of infective jaundice.

B. Coli.

B. coli pyelitis is common in women and children but is not so frequent in adult males; the finding of *B. coli* in the male is more suggestive of prostatitis or cystitis. That the appearance of the organism in the urine is often intermittent is due, in some cases, to a blocking of the ureter with débris. In children ureteric blockage causes high fever with rigors, and the most acute cases of pyelitis in infants sometimes yield negative findings until more than one examination has been made. The amount of associated pus is, to some extent, an index of the severity of the infection, and a regular quantitative estimation will show a diminution when the condition is improving. Bacilluria without cellular reaction is not uncommon; it is an extremely chronic condition and is resistant to treatment. In pyelitis the clinical condition usually shows marked improvement long before the urine ceases to contain organisms, and it may be urged that the only criterion of cure is a series of negative cultures over a long period. Even after a long period of freedom relapses or reinfections are liable to occur. The most hopeful cases for permanent cure are acute conditions in which the urine rapidly becomes sterile. Acute pyelitis is on rare occasions accompanied by profuse hæmaturia. Casts should suggest the possibility of pyonephrosis secondary to pyelitis. *B. coli* cystitis is usually secondary to pyelitis or to prostatitis. When the urine is offensive and, in addition to pus, contains a considerable amount of bladder epithelium as well as a fair quantity of mucus, cystitis should be suspected. The infection is frequently complicated by additional organisms such as streptococci and staphylococci.

Other Coliform Organisms.

Coliform organisms which for clinical purposes may all be classified as "atypical *B. coli*," are found in the urine with considerable frequency. The commonest of them is *B. proteus vulgaris* which is associated with chronic infections of the prostate, bladder, and renal pelvis. The significance of atypical organisms is apparently no more than that of ordinary *B. coli*, and conditions due to them should be treated in the same way.

Typhoidal Organisms.

Urinary carriers of typhoid and paratyphoid bacilli are not uncommon and the finding of the organism in the urine implies a renal focus of infection. The excretion of the bacilli is intermittent and may not be found by a single examination. The routine employment of litmus-lactose-agar medium sometimes identifies an unsuspected typhoid carrier. During active typhoid fever the bacilli are most commonly present in the urine from the third week onwards. It is a sound policy to insist upon three consecutive negative cultural examinations of the urine before discharging a typhoid patient as cured.

Staphylococci.

Staphylococci can always be cultivated from the urethral meatus and the first few centimetres of the urethra. Consequently staphylococci are frequent contaminants of non-catheter specimens of urine and a few may even be collected on a catheter during passage. The appearance of a few colonies of *Staphylococcus albus* on a culture medium can usually be disregarded.

Heavy staphylococcal infections are common as a sequel to the passage of an unclean catheter, as a secondary infection in genito-urinary tuberculosis, and as a superposed infection in renal or vesical calculus. Simple staphylococcal cystitis should never be regarded as a satisfactory diagnosis but should be looked upon as a direct hint to search carefully for a tuberculous lesion, for a calculus, or for a prostatic focus of infection. Staphylococcal cystitis, associated with stagnation of urine due to prostatic enlargement, results in ammoniacal decomposition of the urine. Staphylococci associated with hæmaturia and casts suggest infarction of the kidney with an infected embolus, particularly if the organism is of the aureus variety.

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* Part I., Preliminary Tests for Infection, appeared last week.

Diphtheroid Bacilli.

These are meatal and urethral organisms and are not regarded in themselves as capable of producing a primary urinary infection. They are frequently found associated with a causal organism in cases of prostatitis and cystitis.

Streptococci.

The significance to be attached to the presence of streptococci depends greatly on the type of streptococcus found as well as on the clinical condition of the patient. Renal infarction in infective endocarditis results in the appearance of casts, red cells, and streptococci in the urine; it is relatively uncommon for the red cell content to be sufficient to be detected by the guaiacum test.

Apart from acute streptococcal septicæmia there is no doubt that small numbers of streptococci find their way into the blood stream in such conditions as acute tonsillitis, acute or generalised rheumatism, the early phases of broncho-pneumonia, or in heavy dental infections. The circulating organisms probably lodge as minute embolic foci in the kidney and they may be detected in cultures of the urine. The number present in the urine is usually small and there may be no other evidence of renal infection except an occasional red corpuscle. An elongated diplococcus, generally regarded as a variety of streptococcus, may be found at the urethral meatus, and is commonly present in the prostate, secondary to gonorrhœa. Cystitis may be caused by the same organism, usually in association with *B. coli*.

Gonococci.

Gonococcal cystitis is comparatively rare, particularly in males, and the presence of pus and gonococci in a non-catheter male specimen suggests urethritis or a ruptured prostatic abscess, unless the clinical symptoms point to an obvious cystitis.

Tubercle Bacilli.

Tubercle bacilli in the urine imply a tuberculous lesion of the genito-urinary tract requiring a thorough clinical examination in order to locate the exact site and extent of the disease. The question of confusion of *B. tuberculosis* with the acid-fast *B. smegmæ* is negligible and need not be considered if a catheter specimen is examined or if an acid-alcohol decolorising technique is used. The influence of early diagnosis on prognosis renders important a clear understanding of the limitations of the present bacteriological methods for detecting genito-urinary tuberculosis.

As a general rule, the appearance of tubercle bacilli in sufficient numbers to be found in a stained smear indicates an advanced lesion. It is therefore desirable to use every means for making a diagnosis before the condition has reached this stage. Earlier diagnosis may be made by guinea-pig inoculation, but even this method is not absolute, for it is estimated that from 10 to 160 living bacilli, according to virulence and type, must be inoculated into the animal before tuberculosis can be produced. Animal inoculation is thus a useful test, but is not conclusive, and it has the disadvantage of necessitating a delay which may last from 6–8 weeks. Frequency, hæmaturia, or pyuria all merit full investigation for a tuberculous focus. The most valuable and significant laboratory finding in early cases of tuberculosis of the urinary tract is an acid urine containing a small quantity of pus, with perhaps a few red cells, but with no bacteria demonstrable in films or cultures. It is not generally recognised how frequently secondary infection occurs in renal or cystic tuberculosis, and that acceptance of *B. coli* or staphylococcus as the primary infecting agent may lead to the missing of a case of tuberculosis. Whenever renal tuberculosis is suspected, it is bad policy to await a result from a bladder specimen before investigating ureteric specimens.

Other Organisms.

Adhesions with communications between the bowel and the bladder may occur with carcinoma of the rectum, with diverticulitis and, with typhoidal, dysenteric, or other ulcerative conditions. In such cases the bladder becomes infected with the fæcal flora and the urine contains a large variety of bacteria, the most suggestive of which are the obvious intestinal anaerobes. *B. pyocyaneus* occurs in chronic cases of cystitis or pyelitis, but is usually secondary to some more virulent primary organism.

The urine may contain *Brucella melitensis*, *Leptospira icterohæmorrrhagiæ*, and the ova of *Bilharzia hæmatobium*, in which case the diagnosis is obvious.

LIONEL E. H. WHITBY, M.D. Camb.,
M.R.C.P. Lond.,
Bacteriologist to the Bland-Sutton Institute of Pathology,
The Middlesex Hospital.

Special Articles.

THE EVOLUTION OF HOSPITAL SCHOOLS:

COMBINED TREATMENT AND EDUCATION FOR CHILDREN SUFFERING FROM PHYSICAL DEFECTS.*

BY SIR HENRY GAUVAIN, M.D., M.CHIR. CAMB.,
F.R.C.S. ENG.,
MEDICAL SUPERINTENDENT OF THE LORD MAYOR TRELOAR CRIPPLES' HOSPITALS AND OF THE MORLAND CLINICS, ALTON;
AND
EVELYN M. HOLMES, M.B. MANCH.,
RESIDENT MEDICAL OFFICER, MORLAND CLINICS, ALTON.

(*Concluded from p. 792.*)

THE aim of education is to give to the crippled child as many of the amenities and advantages of ordinary school life as is possible, to encourage corporate life and the happy school atmosphere, whilst by specially selected methods endeavouring to "catch up" along the lines of education in normal elementary schools.

To the normal child education is its chief asset; how much more it meant to the cripple was not realised until it was tried. In hospital schools, too, it has been found to have a definite medical value. It makes periods of rest and exercise easy to regulate and keeps the child busy, interested, and happy. If by means of these educational facilities the cripple only gains and retains confidence in his relationship with the ordinary world the effort would be worth while, for it was the feeling of his inferiority, his inability to make a success of life, as much as his sensitiveness to an unsightly complaint that so overwhelmed and distressed him. But it does more than that. It enables him to enter into and profit by training in industrial occupations and take his stand both in the social and the industrial life of the nation when the time comes. It has been estimated that even with present facilities 80–90 per cent. of crippled children passing through special schools and training institutions are found able to compete for work in the open market. From being a menace to society the cripple had become an object of charity, but now the attitude has changed again and the cripple is being accepted as an instance of civic responsibility.

The Task Before Us.

Recent figures issued by the Board of Education with regard to physically defective children are of interest in showing how great the problem is. It is estimated that there are amongst elementary schools in England and Wales some 83,000 children for whom special provision should be made. Of these, according to the latest figures,[18] 65,230 are suffering from malnutrition, deformity, tuberculosis, or cardiac crippling, and the present accommodation, according to the same report, is: in open-air schools, 2078; *in cripple schools, 980; and in hospital schools, 3372;* leaving a residue of 58,810 of these cases still unprovided for.[19]

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* A paper read before the Medical Officers of Schools Association on March 15th.

Special schools are now admitting, as well as a certain number of serious heart cases, a small proportion of debilitated children.

London has no residential school within its boundary; it utilises schools established by other local authorities and by philanthropic societies. Some conception of the extent of the work undertaken may be visualised when it is realised that the ambulance system for the day schools of the physically defective in London alone costs £35,000 per annum.[20]

Schooling and Treatment.

A number of residential schools for such children are now in existence, but these are not hospitals in in any sense of the word. The children are admitted to be housed and educated, not for treatment. Should any treatment of children in special schools be thought necessary, it is customary to send them into general hospitals. The orthopædic hospitals such as Heatherwood at Ascot, Mansfield at Northampton, Royal National at Portland-street and Stanmore, Treloar's at Alton, St. Nicholas at Pyrford, Shropshire at Oswestry, Wingfield at Oxford, and others provide schools with qualified teachers, and in some the organisation reaches a high point. But it is not essential that education be given in these hospitals. If the hospitals care to make suitable provision for the education of their children they may apply for certification as "special schools," under the Board of Education, and if sanctioned may also receive grants both[21] in aid of treatment and of education. Although seven new hospital schools have opened since April, 1927, the number of hospitals which receive orthopædic cases under local education authority provisions, and which do not offer educational facilities to the children, is as great as 44.[22 23] The inevitable result is that where education has not been provided this has to be "made up" to the child on discharge at much greater expense to the State.

It is now considered that not only are the great bulk of crippling defects preventable, but curable, and should the incidence of disease continue to diminish as it is doing at present, and for those children requiring treatment and capable of education the hospital school scheme be still further developed, the need for special schools as such would diminish.

Throughout the country, schemes for the detection, treatment, education, and after-care of the physically defective are ever extending. New schemes were approved by the Board of Education in 28 areas in 1927 making a total of 160,[24] but there are still 157 areas where no authoritative provision whatever has been made.[25] In practically every case the first move has been made by private individuals or voluntary associations, the local education authority stepping in afterwards and the two continuing to work in conjunction. The correlation of schemes involving various educational and health authorities, as well as voluntary associations for cripple children in the different areas and of different age-groups from infancy until the completion of their treatment and education, has been a matter of great difficulty. Much has depended on the voluntary workers. Indeed, it is the voluntary worker who has originated every advance that has taken place, for no Board of Education, or even Ministry of Health, dare take over such responsibility until its beneficial results are already a proved and certain fact. Surely this is a sound argument for the retention of our voluntary hospital system and the blending with it of State service.

In after-care work the voluntary associations are still almost wholly responsible in the matter of organisation and in finance, except for a substantial grant received by the after-care committees in the London area from the Ministry of Labour.[26]

Such work is of the greatest value. It is now for medical science to show how by taking every measure to prevent the onset of deformity, by sparing no pains to treat efficiently the crippling defects of childhood and by giving every possible educational facility to the child under treatment, the nation would be repaid for the expenditure incurred by the conversion of the cripple into a healthy, happy, and useful citizen. A national movement to complete the schemes for the physically defective throughout the country would never be regretted.

Open-air Schools.

An important movement in the interests of defective children has been the recognition of the value of open-air schools. The first of these was opened at Plumstead in 1907, others followed, and their results have been so excellent that the scheme is ever-widening and even being extended for the normal child by the provision of open-air play and classrooms. In the last report available it is stated that there is now accommodation for 6001 pupils in day schools and 2078 in open-air schools.[27] Some of these schools have advanced to the stage of being schools where sun-treatment is combined with open-air and education. The first open-air school in London to adopt sun treatment was Stowey House, Clapham Common, and the headmaster, Mr. Green, and his assistants, are enthusiastic and convinced of its value.

The *Times* of March 13th, 1929, abstracts the 1927 report of Mr. Gater, the Education Officer of the London County Council, which commends open-air schools, and referring to one in East London states: "The garden (*a former refuse dump*) is surrounded by docks, factories, a railway terminus, and old houses. The garden is now maturing and provides a pleasant background, making outdoor life for the subnormal child seem really worth while. Twenty-eight boys attended an open-air class, camping out in blankets during the winter with definite physical benefit. The boys showed no wish to return to the class-rooms."

The Latest Advances.

The latest advance in schemes for the physically defective child has been the widening of the scope of hospital schools to include other forms of physical defect beyond crippling as ordinarily understood. As examples may be cited the lupus wards at the Treloar Cripple Hospital, and hospital school accommodation for cardiac cripples and other debilitated children. There is unlimited scope for further extension in this direction, and fortified by the experience of the past there is no doubt that the next few years will see great developments. The need for a comprehensive register to include all defects amongst school-children requiring skilled treatment combined with education is now called for. In addition to the various crippling conditions records are needed of all cardiac and rheumatic cases, debility, malnutrition, intractable anæmias, bronchiectasis, asthma, diabetes, and other affections. Valuable preventive work would be done by open-air hospitals for the temporary accommodation, treatment, and education of children convalescing from debilitating diseases. Already it has been demonstrated that since prolonged in-patient treatment for cardiac cases has been in vogue, wonderful results have been obtained. Dr. A. P. Thomson, medical officer to Birmingham special schools, states: "Many cardiac lesions recover to a remarkable extent and many hearts that seem damaged for life recover in time and become normal, even in older children."[28]

The importance of this subject must be our apology for the length of this paper. We would like to have described in detail the hospital schools, the treatment adopted, and the type of education offered, differing according to the social needs of the patient as well as by reason of their disabilities. One point, however, must be emphasised. The hospital school, for whatever class of children it caters, must be in the country or at the seaside and not in a town. It must be conducted as an open-air institution to raise the metabolism and increase the vigour and physical fitness of the pupil. Intermittent sun treatment should be employed for both its effect on the mind and the body. We regard its value in evoking mental activity as at least as great as its influence on bodily defects.[29] [30] Further details of treatment or education we may not pause to discuss.

For a child to derive full benefits from education, he or she should, if showing a pathological divergence from the normal, be restored as speedily and as fully to the normal as is possible, and during this process, if that is necessarily lengthy, education modified to, and planned for, his particular needs should be available. But the doctor must lead the way. The responsibility is primarily his and he will find the intelligent teacher eager and willing to coöperate if taught how. The hospital school for all classes of the community is the most urgent need of every physically defective child and is of equal or greater importance to such a child or adolescent as is the ordinary school or university to its normal pupil. During the past 20 years over 5000 physically defective children have been under the care of one of us (H. J. G.) for combined treatment and education or training. Brief notes on a few such illustrative cases will afford tangible evidence of the value of such care.

Cases from the Treloar Hospital (Elementary School Type).

A. B., a cachectic girl, admitted May, 1918, with tuberculous disease of the hip with abscess formation. Discharged September, 1920, with disease arrested, no deformity, hip fixed by fibrous ankylosis. This child was exceptionally intelligent, as is shown by the following extracts from a letter from her:—

"I think you will be interested to hear something of the career of an old patient of yours at Alton, if only because it forms a not uninteresting example of the difference which Alton may make to any individual. . . . I left in September, 1920, when almost 14 years old. When I had been at home a few months I was sent to school and placed in a form of girls of my own age, although, of course, I was far behind them. In 1925 I obtained from Southampton Girls' Grammar School the Rooper scholarship tenable at University College, Southampton. . . . In June of this year I sat for the B.Sc. (Econ.) examination of London University and obtained the only first-class honours degree given on the external examination, and was awarded the Gladstone Memorial prize. During this autumn I was given the Metcalf studentship by London University to enable me to undertake research at the London School of Economics. . . . While I am conscious that this catalogue of my achievements sounds very like self-advertisement, I am far more conscious of its being an advertisement for the good done me at Alton, and for which I shall always be grateful."

C. D., a cachectic freckled boy, aged 11. Admitted April, 1919, with cervico-dorsal caries and paraplegia. Discharged February, 1921, with the disease arrested, no deformity. The boy subsequently emigrated to New Zealand, and in a recent letter writes as follows:—

"I can now do as good a day's work as anyone, harvesting or anything at all. . . . I've got a ripping horse of my own, a six-year-old bay filly, so I'm always out after deer and fish. I can ride in great style now, although my horse runs away with me now and again—she's a bit flighty."

We could give hundreds of examples of a successful and happy career following treatment. One girl sent by the late Dr. F. E. Batten with spinal caries and psoas abscess is now one of the leading lady lawn-tennis champions. Here is a case illustrating treat-
quantity of education in the hospital and training in
with no bacteria
It is not generally recog cripple, admitted to hospital with
infection occurs in renal psoas abscess, transferred when
that acceptance of *B. coli* or three years' training. Dis-
primary infecting agent may lead t: First started work
case of tuberculosis. Whenever re en commenced busi-
is suspected, it is bad policy to await ut now good, and was employing a
bladder specimen before investigat whom had been

The training given to the lads in the College brings out most remarkably their self-reliance and resourcefulness. Though handicapped by their physical disabilities not only do they become good citizens, but extract from life pleasures from which it might be supposed they would be debarred. As an example, *Cycling* for January, 1928, reports a cyclist (an old trainee at the College) who had cycled 8308 miles in the year with only one leg, his longest day's run being 123 miles. This boy is now a successful journeyman tailor.

Cases from the Morland Clinics (Secondary and Public School Type).

H. I., a girl of 14, admitted with tuberculous disease of the dorsal spine and complete paraplegia. Treatment combined with education occupied two years. Recovery without deformity. Became head girl of her school and captain of the tennis and hockey teams. Was last seen six years after leaving school. She had that day played two rounds (18 holes each) of golf. Remains perfectly well.

J. K., spinal caries with deformity and psoas sinus. Had been recumbent for ten years. Very cachectic on admission. Sinus healed in six months. Deformity reduced and imperceptible. Treatment 15 months. Was coached for "little-go" while being treated, and entered Cambridge University. At Cambridge distinguished himself as a daring *motor-cyclist racer. Graduated. Now in partnership* of an important firm and displaying great business ability.

L. M., spinal caries with extreme deformity. Paraplegia and incontinence for seven years previous to admission. Cord completely destroyed as shown by laminectomy. Later excelled at archery, passed high in his tripos at Cambridge. Entering on a specialised legal career, which should be highly useful and remunerative because of his special gifts, though he necessarily remains paraplegic. Drives his own car by hand control.

In less severe cases equally valuable results may be achieved in much less time, e.g.:—

A boy, otherwise healthy, with lupus vulgaris on the forehead which had resisted all treatment. Of a naval family it was desired that he, too, should enter the Navy. Treated by Finsen light while preparing for examination. Lesion healed with satisfactory cosmetic results, was passed by doctor, and became a naval cadet. The time factor for treatment was here of special urgency.

A public school boy developed severe cervical adenitis. Admitted for treatment which occupied six months and returned to his school cured and without scarring. Meanwhile, he had been specially coached in weak subjects.

Numerous cases of girls with acquired scoliosis have been treated and meanwhile educated and enabled to return to their ordinary school.

Further examples of such cases might be multiplied almost indefinitely, but the foregoing are sufficient to demonstrate the value of combined specialised treatment and education. Numbers of physically defective boys and girls have had combined treatment and instruction enabling them to proceed to ordinary schools or universities, or, when disability has occurred during their school career, have been able, after treatment combined with education, to complete their education at their original schools or go direct to the university with their disabilities rectified and with the minimum disturbance of their education. The importance to these children of education during treatment will be readily appreciated.

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22. Ibid., p. 178.
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26. Hill, A.: The Cripple, October, 1928, p. 46.
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29. Gauvain, H. J.: The Effect of Heliotherapy and Artificial Light Treatment on the Mentality of Patients, Maternity and Child Welfare, July, 1925.
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LOCAL GOVERNMENT ACT, 1929.

THE FIRST CIRCULAR TO LOCAL AUTHORITIES.

IN addressing to local authorities the first circular[1] on the subject of the Local Government Act, 1929, which became law on March 27th, the Minister of Health makes some general observations on the content and significance of the Act as a whole.

The Transfer of Poor-law Work to Local Authorities.

The most far-reaching change is the transfer to the responsible local authorities of the work which for nearly a century has been organised under a distinctive name and under separate legislation by the poor-law authorities. The transfer will have its most significant effect in bringing about a new situation under which the local authorities—

1. Are made responsible for vaccination;
2. Are made responsible for infant life protection;
3. Are made responsible for the collection of the fundamental vital statistics; and
4. Are made responsible, severally or jointly, for the provision, maintenance, and management of all public institutions for the cure or mitigation of physical or mental disease.

Under the last head there pass to county borough councils and (subject to local arrangements as to management) to county councils, many thousands of beds for sick and mentally infirm patients in separate infirmaries and other institutions; and it must be remembered, in conjunction with this transfer, that security is taken for the proper provision in future of beds for infectious diseases for the inhabitants of every county area either by one of the authorities (the county or district council) for the area, or by some other authority who have beds to let on agreed terms.

At the same time the vital importance of retaining the personal touch in the administration of poor relief finds recognition by the provision made in the Act for guardians committees in county areas, doing the actual work of relief locally in close contact with the recipients of relief, and being constituted to a defined extent of members of the county district councils.

The New Organisation of Poor-law and Public Health Work.

By the transfer to them of the responsibility of poor-law authorities for the treatment of the sick poor in institutions, in conjunction with the enlarged powers now conferred upon them to provide hospital accommodation for all types of cases, and to organise properly the provision and use of infectious diseases hospitals, local authorities are placed for the first time in a position to survey the whole of the public hospitals in their areas, and to use them to the best advantage in the light of the principles which Mr. Chamberlain summarised as follows in moving the second reading of the Bill:—

> "The whole trend of practice in modern medicine and surgery is towards the treatment of many cases in institutions, where there can be accumulated the specialised equipment and specialised skill which are not always available in private homes. When this Bill becomes law we shall have a position in which there will be one single health authority in each area whose duty and function it will be to survey the whole institutional needs of that area. They will have at their disposal all the institutions which are now in the hands of the guardians, in many of which the accommodation is not fully occupied. They will have an opportunity of reclassifying their institutions, of closing such as are no longer suitable for modern requirements at all, of altering and adapting others and using one for one purpose and another for another purpose. Even to-day there is a certain amount of classification attempted in many of the institutions of the guardians, particularly in the large areas, but I think it must be clear to everybody that, with the small numbers that are to be found of each particular kind of case in any particular institution, it is quite impossible either to get the sort of classification that you want, or to bring to it that equipment and that specially skilled staff and nursing which is essential if you are to get the best results."

Local authorities are required by the Act, in preparing administrative schemes for carrying out the work in relation to the provision and use of public hospitals, and the other work, transferred to them from poor-law authorities, to have regard to the desirability of securing that, as soon as circumstances permit, any assistance which can lawfully be provided otherwise than by way of poor-law relief shall be provided exclusively by virtue of the several Acts specified in Section 5. A clear direction is thereby given that the process known for the last 20 years as the break-up of the poor-law shall be put in hand in a practical manner and carried so far as the existing law and the prevailing circumstances allow.

Further amendments of the law directed to this end are not, of course, excluded or rendered more difficult by this provision, but certain criticisms were made in Parliament during discussion of the matter on the two points (1) why the law governing the relief of the poor (as distinct from the responsibility for administering that law) should not first be transformed before being transferred to new authorities to administer; and (2) why the process conveniently termed the break-up of the poor-law should not be made compulsory upon all the new authorities at once.

In reply to criticism on the first point Mr. Chamberlain has expressed the view that any question of the amendment of the law under which poor relief is provided can more profitably be discussed and determined after the new authorities have had a reasonable opportunity of familiarising themselves both with the statute law as it stands in the consolidating Poor Law Act of 1927, and with the subordinate legislation bearing on the transferred work, and of considering their powers and obligations in this new sphere in the light of their general experience of local administration.

In meeting criticism on the second point, Mr. Chamberlain has thought it reasonable to urge not only that a direction to local authorities to use their alternative powers of giving assistance always, and at once, in one manner only, would be out of harmony with the basic principle of the Act that the responsibility of authorities for the conduct of local affairs should be respected and enlarged; but also that such a direction, if given, must, in some areas at least, be disregarded, because the accommodation in institutions at the disposal of the authorities in the first instance, even after the transfer to them of poor-law work, will not suffice to enable them in every case to provide assistance which takes the form of institutional treatment except by way of poor relief.

The Future of Public Health Work in Counties.

After more than 50 years of discussion and unsatisfactory progress, definite provision is made to secure to every county district council at the earliest possible moment the services of a medical officer of health whose attention will be concentrated upon public duties. The inhabitants of the poorer parishes and districts are for the first time afforded the alternative possibilities either of securing the acceptance by others of a share of any undue burden which the cost of providing themselves with a water-supply or sewerage would impose; or even, in the last resort, of arranging that the management of services such as these shall be concentrated in the hands of county councils, if that course is found most advantageous in practice to health and well-being. Full facilities are afforded under the Act for preventing dispersal of money and effort intended for the welfare of mothers and children in the several parts of any county, by concentrating work directed to that end in the hands of those authorities who are in a position to undertake, if not the whole, at least some substantial portion, of the services which go together to form the basis for systematic arrangements of this nature (notification of births, provision for maternity and child welfare, school medical work, and supervision of midwives).

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[1] General Circular on the Local Government Act, 1929. No. 1000. H.M. Stationery Office. 3d.

Consultation between Local Authorities and Local Bodies representing Voluntary Hospitals.

In many areas the guardians have, in the exercise of their duties under the poor-law, provided separate infirmaries which in some areas are already equipped up to the same level as the voluntary hospitals of the area, and in others are rapidly approaching that level. To an increasing extent admission to these infirmaries has been provided on repayment terms for members of the community who cannot be said to be destitute otherwise than to the extent that they have need of expert medical assistance, cannot afford to obtain it in a nursing home, and cannot obtain immediate or early admittance to a voluntary hospital. In any area in which a poor-law institution of this type is to be transferred to the local authority, whether the local authority do or do not make a declaration under Section 5 of the Act, the problem of finding means of coöperation with the voluntary hospitals in the area obviously arises, and it will also certainly arise in other areas where the provision of a self-contained public hospital by way of poor relief or otherwise, or the expansion of existing buildings on hospital lines, is a matter requiring consideration in the interest of the inhabitants.

The provisions of Section 13 of the Act secure that by consultation between the local authorities and local bodies representing voluntary hospitals the provision and use of hospital accommodation in every area is not achieved to the accompaniment of any unnecessary and wasteful competition between public and voluntary bodies. It will accordingly be incumbent upon the council of every county and county borough, when making provision for hospital accommodation in discharge of the functions transferred to them from poor-law authorities, to consult such committee or other body as they consider to represent both the governing bodies and the medical and surgical staffs of the voluntary hospitals providing services in, or for the benefit of, the county or county borough, as to the accommodation to be provided, and as to the purposes for which it is to be used.

Mr. Chamberlain, it is stated, attributes the greatest importance to the proper carrying out of this section. In making the necessary institutional provision for the health of the people, it is imperative that local authorities should establish the most cordial relations with, and should make the fullest use of the accumulated skill and experience of, the medical profession in regard to hospitals.

The last sentence of the circular reads: "It is the confident hope and expectation of the Minister that as procedure under Section 13 becomes established and regular, it may lead to wider arrangements for the fullest consultation between the local authority and the medical profession, not merely in regard to institutional accommodation and its use, but also in regard to those numerous developments in the health provision of the people which are implicit in the new organisation laid down by the Act."

MEDICINE AND THE LAW.

Liability for Notification of Birth.

A PARENT was fined at Mortlake police-court on April 10th for having failed to notify the birth of a child last December to the medical officer of health for Barnes. The liability arises under the Notification of Births Act, 1907, originally an adoptive statute, but made to apply generally throughout Great Britain in 1915. This Act is an addition to the other statutory requirements for birth registration. It makes it the duty of the father of a newly-born child, if he actually resides in the house where birth takes place at the time of its occurrence, to send written notification to the medical officer of health within 36 hours. The Act says that the local authority is to supply stamped addressed postcards free of charge to any medical practitioner or midwife practising in that area who applies for them. The wording of the statute is somewhat vague. After setting forth the duty of the father, the Act says the same duty is imposed on "any person in attendance upon the mother at the time of or within six hours after the birth." As is suggested in "The Conduct of Medical Practice," the intention must be to make the father primarily liable (provided he is actually living in the house when birth occurs), the medical practitioner being liable (qua person in attendance) if the father defaults. It is advisable for the doctor to bear in mind his responsibility to notify (*a*) if the father is absent from home, or (*b*) if the father has failed in his duty. It is a good defence under the statute if either father or doctor "satisfies the court that he has reasonable grounds to believe that notice has been duly given by some other person." That was the father's attempted defence at the recent proceedings at Mortlake; he said he thought the doctor had made the notification "as was generally the case"; he had himself been ill at the time owing to a motor accident; and the child had died shortly afterwards. The clerk to the Barnes District Council pressed for the maximum penalty of 20*s.*; he said that the father had been written to on the subject several times and that, as the council had had several similar cases recently, it was decided to prosecute in order to make an example of him. The bench imposed a fine of 5*s.* with 6*s.* costs, which seems to show that the magistrates did not take a very grave view of the offence.

Medical Inspectors in Divorce Cases.

In Stroud *v.* Stroud otherwise Grantham, recently reported in the *Solicitors' Journal*, a decision was given on the method of appointing medical practitioners to examine parties concerned in matrimonial causes at assizes. It may be remembered that in 1920 Parliament allowed divorce cases to be tried at assizes instead of in the divorce court in the London law courts. This has undoubtedly lightened the work of the court in London; it has also proved economical because the parties and witnesses can attend for trial nearer their own homes. Under the Poor Persons Rules (Order XXXVA of the Rules of the Supreme Court) a "poor person" can begin his action under the Matrimonial Causes Acts in a district registry instead of in London. One such case, in which there was an undefended petition for nullity of marriage on the ground of the wife's impotence, was tried at Lewes Assizes last December. The District Registrar appointed two local doctors practising at Eastbourne to examine the parties and report to the court. These two practitioners were not on the official rota of medical inspectors for the Divorce Division and, although the case was in other respects free from difficulty, Mr. Justice Rowlatt postponed the drawing up of the decree nisi until after he had heard argument on the question of the District Registrar's authority to appoint practitioners outside the rota. In February the point was argued. The petitioner had to support the action of the district registrar on which the evidence for the decree had been based. It was argued on his behalf that the court's matrimonial jurisdiction was historically ecclesiastical in origin; the appointment of medical inspectors, according to the former ecclesiastical practice, would be a matter for the registrar; under the Poor Persons Rules, where a matrimonial cause is begun in a district registry, the district registrar is deemed to have the powers of a registrar in the Divorce Registry in London. The Judicature Acts have of course modernised the legal system considerably; but both Section 23 of the 1873 Act and Section 32 of the 1925 Act (which consolidated the previous enactments) declare that, when no special provision to the contrary is to be found in the statute or in rules of court, any jurisdiction is to be exercised as nearly as possible in the same manner as by the court to which it formerly appertained. Mr. Justice Rowlatt accepted the argument and held that the district registrar had had full power to appoint the practitioners who acted as medical inspectors.

Swab Left in Patient's Body.

At a recent inquest at Llanidloes it appeared that the deceased had undergone an operation at Ebbw Vale Hospital last December, and, having gone to Llanidloes for convalescence and still feeling ill, had been operated upon again at Llanidloes Hospital. Dr. Milwyn Burrell, who performed the second operation on March 21st, before the patient's death, described the finding of a large pack or swab in the abdomen. He considered death was due to ulceration of the intestines from irritation caused by the swab. Asked if he regarded himself as responsible for counting all instruments and swabs at an operation, Dr. Burrell replied that the surgeon could not do this; he must leave it to someone else; the common practice was to leave it to the theatre sister. It was, he said, the surgeon's duty before closing the wound to inquire if all instruments and swabs are accounted for. Dr. John Dunlop, of Abercarn, who performed the operation in December, described the operation and said he removed all the swabs he could see. Dr. James Sullivan, who was assisting, asked: "Are all the swabs out?" and the answer "yes" was given; he did not know by whom. Dr. Dunlop said he then closed the wound; he thought the patient's heavy breathing might have sucked in the swab and in the necessary hurry this one had been overlooked. The matron of the Ebbw Vale Hospital described what was done at the first operation. The jury found that death was due to a swab being negligently left in the patient's abdomen at the operation in December, but they added their opinion that the negligence was not of a criminal nature.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Public Health in the Free State.

THE vote for the Department of Local Government and Public Health, which was taken in the Dail last week, gave deputies an opportunity to criticise the work of the department. In proposing the vote of £302,556, the Minister said that there was an increase of £59,915 for housing. There was a slight decrease for other services. The contribution for social services amounted to £106,396, including maternity and child welfare work, medical treatment, meals for school-children, and treatment of tuberculosis. The department had no reason to be dissatisfied with the appointment of medical officers of health, who were now being appointed in many counties. He had before him a draft Bill dealing with the reports of the Poor-law Commission and the National Health Insurance Committees, but he was not in a position to say when these Bills would be presented to the House.

Mr. S. O'Kelly, in moving that the estimates be referred back, said that there was not enough money available for the requisite social services. The infant mortality in Dublin was 118 per 1000, and something should be done to remedy that. Dr. O'Dowd drew attention to a grave outbreak of enteric at Carrick-on-Shannon, due, he suggested, to contaminated water-supply. Sir James Craig urged that there should be a Minister, or at least a Parliamentary Secretary, for public health, who had had a medical training. He said that the sanitary condition of some of the small towns and villages was deplorable. He asked what progress had been made in the medical inspection and treatment of school-children. Mr. O'Reilly called attention to the malnutrition exhibited by many school-children, and to the lack of sanitation and water-supply in towns and villages where fairs were held. Dr. Tubridy spoke of the need for improved housing in rural as well as urban areas, and complained of the unsuitability and lack of equipment of rural dispensary premises. Dr. Hennessy suggested that the importance given to a knowledge of the Irish language led to the appointment of relatively inferior medical officers. They should see that the best doctor was appointed, irrespective of any language. He agreed that in an Irish-speaking district a doctor should know Irish to discharge his duties efficiently. Nevertheless, too much attention should not be paid to language. "Veterinary surgeons were notorious for making accurate diagnoses of their cases, and they did so without conversation with their patients."

The Minister, Mr. R. Mulcahy, in reply, deplored the lack of public education in the country in regard to sanitary matters. He expressed some doubt as to whether the grants given to mental hospitals might not be more usefully employed in some other service which got more closely to the root of the prevention of disease. The vote was carried.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Syphilitic Infection of a Pathologist.

AN assistant pathologist at a municipal hospital contracted syphilis as a result of making a post-mortem examination of a child who had died from the disease. He therefore brought an action for damages against the city and the chief pathologist. In support of his plea that there is danger of syphilitic infection at autopsies he quoted cases from the literature, and he claimed that the city was under an obligation to protect the dissecting staff against infection. It was the rule in other pathological institutes, he said, to wear rubber gloves and he had repeatedly asked the chief pathologist for permission to do so. The chief pathologist, however, had always denied that syphilis could be transmitted by dissection and had mocked at the idea of prosectors using gloves. Although he had not actually prohibited the wearing of gloves he had by his conduct made it almost impossible for his inferior to use them. By saying, moreover, that cases of syphilitic infection at post-mortem examination had hitherto neither occurred nor been reported, and by diagnosing the plaintiff's chancre as an ordinary post-mortem tubercle, thus causing a delay in the use of antisyphilitic treatment, the chief pathologist had impaired his assistant's health and had acted negligently. The city authorities had been guilty of great negligence, too, in not providing satisfactory gloves. Only after the accident had new gloves been furnished.

The defendant said that he had not at all prohibited the use of rubber gloves which had always been at the disposal of his assistant. According to many pathologists dissecting with gloves was sometimes more dangerous than without. The plaintiff had shown his injury to him only a month after the dissection, and being a medical man he ought to have ascertained the nature of the disease himself.

By an injunction the defendants were ordered to pay the plaintiff 600 M. (£30) a month, but on appeal this decision was quashed. In judgment it was stated that in the expert opinion of several pathologists syphilitic infection from this cause was extremely rare and wearing of gloves did not give absolute protection. The chief pathologist had made no order prohibiting the wearing of gloves, and the plaintiff had been very careless in not consulting a medical man from the beginning, relying instead on the opinion of his chief, whom he knew not to be a practitioner. The chief pathologist and the city were thus held not responsible for the accident and its sequels.

The Use of the Soya Bean.

Germany has to pay an enormous sum of money every year for the importation of products destined directly or indirectly for food, and especially for proteins and fat. Dr. Oppenheimer therefore urges the advantages of the soya bean, which is cultivated, especially in Manchuria, as a source of food. A meal prepared from the bean contains 45 per cent. of protein and 22·4 per cent. of fat, and thus has four times more protein than wheat flour and 20 per cent. more calories. It is the cheapest available form of food. Instead of importing meat, eggs, milk, and cheese at a cost of 700 million marks Germany could get the same amount of protein and fat by importing 400,000 tons of soya bean at one-seventh of the cost. Soya meal may be used for making puddings, bread, and cheese, and also may be added to the ordinary rye bread to make it richer in protein. The difficulty would be that the workman not only wants to eat, but also to see, smell, and taste his food, and therefore it is highly probable that he would eat soya bread sandwiches with fat from America and sausage made from pigs fed with corn from the Argentine, thus making useless the importation of soya as a substitute for these products. Soya bean might, however, be of great value in cases of urgency where a population has to be saved from starvation, and for poor people's kitchens and the like.

Hypervitaminosis.

Prof. R. Fischl and Dr. B. Epstein [1] report experiments on the effect of a preparation of irradiated ergosterol (vigantol) on rabbits. They point out that hypervitaminosis has been observed after the indiscriminate use of this substance, manifesting itself by disorders of the myocardium, kidneys, and other organs. To ascertain the effect of irradiated ergosterol on healthy rabbits they administered five drops of vigantol oil twice daily to three rabbits 3 months old. One of the rabbits died after five days, showing on dissection a calcification of the vessels and of other organs. The second rabbit died after 15 days, with severe emaciation and an intensive sclerosis of the ascending aorta and the vena cava. The third rabbit died after a month and had an enormous swelling of the liver with disseminated foci of cartilaginous consistence. Microscopical investigation proved that there was necrosis and calcification of the parenchyma without parasitic invasion. While rabbits are very sensitive to vigantol guinea-pigs have a relatively high tolerance. It follows from these experiments, however, that vigantol is not an innocuous remedy in large doses, but has a powerful action in mobilising calcareous substances in various organs. It may lead to severe morbid conditions endangering life. Rabbits with rickets do not stand administration of the preparation better than healthy animals. Although the results of the experiments cannot be applied without reserve to the human species they must lead to a cautious administration of irradiated ergosterol. Fischl and Epstein declare that from their experience in the Pædiatric Clinic of Prague University they have not formed so high an opinion of the prophylactic and therapeutic value of vigantol as have other authors. They think that the time has not yet come for allowing its general use.

How to Keep Young.

Prof. Fürbringer, former chief physician to the Friedrichshain Municipal Hospital at Berlin, gives rules for prolonging life based on his own experience. Physical exercise he regards as very healthy; at the age of 80 he continues to indulge in a walk of 10–20 kilometres twice a week, and still climbs in the Alps, swims in summer, and skates in winter. He has reluctantly given up cycling on account of the street traffic in Berlin. Muscular over-exertion, however, must be avoided; whilst food should be poor in fat and salt, and he disapproves of the consumption of much milk. Abstinence from spirits and tobacco is, he thinks, unnecessary, and he prefers temperance. To the soundness of his advice Dr. Fürbringer is himself a testimony, for he is still in practice and regularly attends the meetings of the medical and other societies where he often takes part in the discussions.

Prophylaxis of Whooping-cough.

Dr. Bernuth, of the Pædiatric Clinic of the University of Jena, has experimented on the prevention of whooping-cough by means of a vaccine made from the Bordet-Gengou bacillus. The preparation is sold under the name of tuscosan in ampullæ of 1·0 c.cm., containing doses of 25 to 350 million organisms. The injections are made at intervals of three to four days, and Bernuth says that local rashes are rarely observed and usually disappear within a short time. In five of seven cases in which whooping-cough was imported into the clinic a spread of the disease among other children was avoided. Of 70 inoculated children who came in contact with the patients suffering from whooping-cough only four infants of a few months' old caught the disease. The vaccination is effective for a short time only, infection being possible again some months afterwards. It is desirable to vaccinate as early as possible, but if inoculation fails to prevent the disease it is said to modify the severity of the symptoms.

The Liberal Professions and Unemployment Insurance.

As a result of a resolution adopted in Parliament the Minister of Labour has made inquiries whether it is necessary to include the liberal professions under the insurance against unemployment. Among other bodies he has approached the Hartmann-Bund to ascertain their opinion, and they have answered that there is no need for the medical profession to be included in the unemployment insurance. The profession, they point out, is not a trade-union, but a free profession which has organised, and will continue to organise, the support of its members in cases of necessity without official interference.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdr. T. W. Jeffery is placed on the retd. list with the rank of Surg. Capt.

ROYAL ARMY MEDICAL CORPS.

Maj. J. R. Yourell retires on retd. pay.
Lt. on prob. D. C. MacE. Macpherson resigns his commn.
S. W. Gabbe to be Temp. Lt.

ARMY DENTAL CORPS.

Capt. A. T. Madin to be Maj.

ARMY RESERVE OF OFFICERS.

Lt.-Col. W. C. Croly, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

SUPPLEMENTARY RESERVE OF OFFICERS.

Lt. J. V. Dockray to be Capt.

TERRITORIAL ARMY.

Capts. H. V. Walsh and K. Pretty to be Majs.; M. De Lacey to be Lt.

Supernumerary for Service with O.T.C.: Capt. V. C. Pennell resigns his commn. and is regranted the rank of Capt.

ROYAL AIR FORCE.

A. P. Atkins (temp. Lt. General List, Army, Dental Surgeon) is granted a temp. commn. as a Flying Officer (Dental) on attachment to the R.A.F.

BRITISH MEDICAL ASSOCIATION: AN ART EXHIBITION.—By the kindness of the Salford Corporation it has been made possible to arrange for an art exhibition to be held at the Salford Art Gallery in Peel Park, during the Annual Meeting of the British Medical Association in Manchester. It is proposed that this exhibition should consist of works of art (painting, sculpture, china, and other results of artistic production), either belonging to or executed by members of the profession, or having a special medical interest or association. The Executive Committee will be glad to hear at an early date from any member willing to loan, or influence the loan of, any such work of art. The Salford Corporation have undertaken the insurance and transport free of cost to the lender, the only condition being that objects lent must be left on view for two months. All communications on this subject should be addressed to the chairman, Local Entertainments Committee, B.M.A. Annual Meeting, 33, Cross-street, Manchester.

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[1] Med. Klin., 1929, xxv., 21.

Correspondence.

"Audi alteram partem."

THE "PHYSIOTHERAPY CLINIC" AND THE PRACTITIONER.

To the Editor of THE LANCET.

SIR,—The relationship between the practitioner on the one hand, and the establishment which provides physiotherapy or the medical man who specialises in this branch of treatment on the other, would appear to be somewhat ambiguous. With the expected increase in the number of such institutions as well as of medical men who devote their attention to this work, the position may well become a little strained. If the difficulties that have arisen, and may still arise, could be ventilated, a useful purpose might be served and the ethical situation become more clearly defined.

The position, as I see it, is much as follows: A practitioner sees a patient and decides that some form of physical treatment is necessary. Having none of the necessary apparatus at his disposal, he has either to send his patient to some institution which provides the requisite treatment or to a colleague who practises in one or other of these branches. In the first case the establishment selected may be run by some unqualified person who may or may not profess to confine his or her activities solely to patients recommended by a medical practitioner. In such an institution there may be no medical supervision of any sort and the patient is left entirely to the tender mercies of a half-trained or ignorant attendant. On the other hand, from the practitioner's point of view, there are advantages, in that he is not likely to lose his patient because he naturally exercises a certain amount of supervision during the course of the treatment. In such an institution the fees are apt to be lower because the services of a qualified man have not to be allowed for in fixing the amount of remuneration demanded by the proprietor of the establishment. If an institution, under medical supervision is selected, the fees are naturally higher and patients of limited means are liable to feel that there is no necessity to pay two doctors where one would do. The consequence is, that the practitioner who sends the patient sees very little more of him.

Then, again, there is a very decided prejudice on the part of many practitioners against having their prescriptions for physical treatment criticised by another doctor who by a look or a word may convey to the patient the impression that their particular doctor knows very little about the subject. Of course, it will be at once urged that such a thing cannot happen between professional colleagues. It does, however, and I venture to suggest that such a possibility is largely responsible for the success of many institutions that have no medical supervision. Of course, there are certain procedures that can only be satisfactorily carried out by a qualified medical practitioner who possesses special knowledge—e.g., X ray work and the applications of radium. Such work should never be left to unqualified persons, and for the practitioner who sends the patient to give instructions as to dosage would be entirely superfluous if not presumptuous. If I write a prescription for a bottle of medicine, I should consider it an intolerable proceeding if the pharmacist who dispenses it showed it to another medical man, and asked his opinion as to its suitability. Surely it should be possible to so arrange matters that medical men may be enabled to send their patients for treatment to institutions where their instructions will be carried out exactly as they are intended, without comment.

Take, for instance, the spas of this country. I know of no case where there is any medical supervision of a bathing establishment. The local practitioners send their patients to the baths for treatment and can rely on the written instructions being accurately carried out. The patient reports to his doctor at intervals during the course of treatment and the prescription is modified from time to time as occasion requires. I contend therefore very strongly that such provision for the supply of physical treatment should be made with regard to the large towns. Of course, I quite realise that in institutions where a definite claim is made for the treatment of certain diseases an adequate medical staff is absolutely essential. Patients are sent to such establishments for a definite purpose. They are sent by their doctors for the fullest investigation and treatment. The medical staff must of necessity have a free hand, and any outside interference would entirely defeat the objects of the institution.

Coming now to the question of the relationship between medical men who specialise in physiotherapy and their professional brethren, the position is difficult. The difficulty is mainly financial. Should the physiotherapist charge consultant's fees? If he does, someone is going to suffer besides the patient, and it is easy to guess who that someone is likely to be. At any rate, it will not be the specialist. The position teems with difficulties. If the patient is sent for an opinion as to the best form of treatment advisable, then the usual consultant's fees are obviously allowable. If a patient of limited means consults me and I consider that a course, say, of diathermy is indicated, I naturally hesitate before sending him or her to a professional colleague, who every time the treatment is given will demand much the same fee that I would for a consultation. I look around for some means of saving my patient's pocket, and if I send him to an unqualified person I expose myself at once to the charge of encouraging irregular practitioners.

Some solution should be found for what appears to me to be a difficult situation.

I am, Sir, yours faithfully,

MATTHEW B. RAY.

Bentinck-street, W., April 10th, 1929.

THE EMPLOYMENT OF BACTERIA IN MODERN WARFARE.

To the Editor of THE LANCET.

SIR,—I cannot help thinking that it would be more gracious if we were all to accept unreservedly the reassurance of our German colleagues in regard to the alleged employment by them of bacteria as a weapon on the Western Front. After all, an entry in an historical work is not really "evidence," and the best historians are fallible. To me it has always seemed impossible to believe that the German Staff, with their high scientific acumen, could have been so shortsighted as to employ a weapon as likely to be lethal to their own troops as to ours. The trench rats did not regard "no man's land" as a boundary. I would go further and suggest that the passage quoted by Lord Moynihan may itself have been inadvertently inexact. In 1917 the late Prof. Adrian Stokes (then in charge of a mobile laboratory) examined a dead rat with enlarged glands. He isolated a bacillus like that of plague. An expert was sent from Boulogne who said it was not in the least like plague, but next day returned and said he was uncertain. The specimens were sent to the Pasteur Institute, where they were reported as indistinguishable from plague. Can this incident have provided the basis for the story quoted? I was intimately associated with Adrian Stokes then and later, but I never heard it suggested that the rat in question was dropped from a balloon. Finally, no British army authority, bacteriological or administrative, has come forward to supply such details as might endow the passage quoted by Lord Moynihan with something approaching scientific accuracy. Without such details I, for one, could not associate myself with Lord Moynihan's unseasonable verdict.

I am, Sir, yours faithfully,
Wimpole-street, W., April 12th, 1929. J. A. RYLE.

To the Editor of THE LANCET.

SIR,—Lord Moynihan very rightly assumes that Prof. Pfeiffer and Prof. Prausnitz are competent "to listen dispassionately to evidence, to examine it critically and to give a true verdict." The evidence he asks them to consider is the isolation at a British field laboratory of *plague-like* bacilli from material dropped by a German balloon in January, 1918. One would have thought it unnecessary to point out to Lord Moynihan that no dispassionate bacteriologist would attach the slightest importance to this evidence without very material amplification. Has he further information regarding this plague-like bacillus, the circumstances of its isolation, and particularly of the material from which it came? Was it really *B. pestis*? The gulf between plague-like and plague bacilli may be a narrow one to Lord Moynihan. To the expert it is a gaping chasm.

I am, Sir, yours faithfully,
J. C. G. LEDINGHAM.
Lister Institute, London, S.W., April 13th, 1929.

To the Editor of THE LANCET.

SIR,—I have read with much regret Lord Moynihan's letter under the above title in your last issue. I am afraid it may mislead a section of the public into the belief that it has been proved that the Germans attempted to infect the allied armies with cultures of virulent bacteria during the recent war. The reiteration of this charge clearly suggests that the probable alternatives are either that the Germans did actually attempt to infect the allied armies with plague or that the bacteriological work done in mobile laboratories was not reliable. As I was for four years in charge of a mobile laboratory and for some time actually in the Fifth Army, I wish to make some observations on the meaning of the record in the History of the Great War to which reference has been made.

It is stated that "bacilli resembling the plague bacillus" were found in material dropped from a German balloon, but there is no further record on the subject; this surely means that bacilli resembling the plague bacillus were found and that further investigation showed that they were not identical with the plague bacillus. It is not conceivable that the bacteria found in this material were actually proved to be plague bacilli and that it was considered so trivial a matter that no further notice was taken of it and that the bacteriologists in charge of other mobile laboratories were not even informed about it. Since, however, it would seem that the phrase in the History may be misunderstood it will be as well to analyse briefly its meaning:—

1. The finding of bacteria in material dropped from a German balloon, since bacteria are ubiquitous; this has no significance, unless it is that the material had not been specially sterilised by heat or other means before it was dropped. 2. The resemblance of the bacteria found to plague bacilli; this presumably means that the bacteria belonged to the Pasteurella group, one which includes the plague bacillus as well as many others responsible for diseases of animals and birds which are not transmissible to man.

There were many bacteriologists with the British forces who had had practical experience of isolating the bacillus of plague, but all had not had this experience; especially was this so in the case of those whose experience had been gained in inland towns in Great Britain. A competent observer meeting a problem of this kind for the first time would conclude that with book knowledge only as his guide he was liable to err in differentiating between the plague bacillus and others in the group which resemble it, and therefore rightly render a guarded report. Whether this is the explanation for the cautious report quoted or absence at the time of facilities for experiments by inoculation I do not know; but it is quite clear that the report is merely an indication to the R.A.M.C. authorities responsible that the matter required further investigation. The suggestion that the bacilli found might be plague bacilli, standing as it does without confirmation, has no significance at all.

It is unfortunate that this particular passage in the History of the Great War should have been picked out for so much publicity.

I am, Sir, yours faithfully,
Leeds, April 14th, 1929. JAMES WALTER MCLEOD.

AN OVERDOSE OF THALLIUM ACETATE.

To the Editor of THE LANCET.

SIR,—There have been so many mistakes and discrepancies in the press reports of the inquest on the three boys, who died from an overdose of thallium acetate, that I would like to state the plain facts of the case.

The strength of the solution should have been 7·8 mg. per fluid drachm, and was based on a prescription handed to the hospital dispenser about two years ago. The prescription was written in the Hospital Pharmacopœia and it has always been understood that the solution sent up from the dispensary would be that strength. Acting on this assumption, the correct volume of the medicine was measured out so that each child should receive a dose of 8·5 mg. per kilo of body-weight. Unfortunately the solution was not correct, a decimal point had been misplaced, and each child received ten times too much. Instead of 8·5 mg. per kilo, 85 mg. per kilo were actually given.

A further point which was not made clear was that, on analysis, the solution from the small bottle "B" was only 5·6 and not 10 times too strong. This is accounted for by the fact that after the children had received their medicine from the larger bottle "A," only about one ounce of the solution was left in the bottle, and on being returned to the dispensary, it was emptied out into the smaller bottle "B," which already contained about one ounce of the solution left over from a previous occasion, and which was, of course, the correct strength.

One further remark I would like to comment on. In one paper I am stated to have admitted that one of the cases to whom I had administered the same medicine had afterwards gone off into a "trance." What I really said was that in all the series of cases we had treated only one reported having slight transient pains, and these did not occur until a week had elapsed after taking the medicine.

I am, Sir, yours faithfully,
J. M. SPENCER SCOVELL, M.D., Ch.B. Edin.
London, W., April 15th, 1929.

BLOOD STANDARDS.

To the Editor of THE LANCET.

SIR,—All clinical pathologists will be glad that attention has been drawn in your columns to the marked variations both in the so-called standard of hæmoglobin content and in the readings of instruments by which this is sought to be determined. Fortunately, however, no experienced pathologist would think either of diagnosing or excluding pernicious anæmia on the colour, index alone—that is, without a careful histological examination of stained films and an estimation of the comparative size of the red cells.

Still, in secondary anæmia, especially where repeated estimations of hæmoglobin are required with a view to determining the effect of treatment, the variation in the standards is much too high. This point has troubled me for some years. The Dare instrument is so steeply graduated as to make a high personal error almost inevitable, and it has the grave disadvantage that it is useless when the hæmoglobin reading is very low. The various dilution methods (Sahli, Haldane, and so forth) are, as Dr. Jenkins points out, set to an arbitrary and variable standard. I have, however, found the Tallquist scale useful, provided that the effect of tint (as opposed to tone) is excluded by making the reading monochromatic. For this purpose a piece of pale green glass is sufficient. Both the variations in the colour perception of different observers and the differences in tint between old and fresh supplies of blood are thereby excluded. I have had before me three Tallquist scales of German, Italian, and alleged British origin respectively, which differ very much in colour, and there is evidently no uniformity in this respect amongst the products of different firms. When read through a green glass, however, the difference is not sufficiently great to invalidate the method for clinical purposes.

The subject of hæmoglobin values was discussed at length in the proceedings of the weekly staff meetings of the Mayo Clinic (Sept. 15th, 1926), when the Dare and dilution methods were controlled by spectrophotometric determinations and by the Van Slyke oxygen capacity test. The variations disclosed were enormous. It is to be hoped that work on the lines of the Mayo Clinic procedure may result in the production of an accepted hæmoglobin standard and an accurate method for its determination. Till then I submit that the Tallquist scale with a neutral tint reading is the best that can be employed in clinical practice.

I am, Sir, yours faithfully,
A. KNYVETT GORDON.

Bedford-square, W.C., April 15th, 1929.

PULMONARY NEOPLASMS.

To the Editor of THE LANCET.

SIR,—Dr. T. C. Hunt's paper on this subject in your last issue contains many points of interest, especially concerning the initial symptomatology and diagnosis of the primary carcinoma of the lung.

In an investigation of 62 cases particular attention was paid to the clinical pathology of 29 which came under observation at the Royal Chest Hospital, and the findings seem to show that the negative results invariably reported in the literature are due to insufficiently thorough examination. Cough and pain are early and cardinal symptoms of the disease, and the sputum or pleural fluid (which is nearly always the cause of the first pain) is worth investigation. Blood in the sputum is much more common than the text-books allow, but it may only occur intermittently or in small quantities, and is probably often omitted from hospital records. Specimens examined microscopically at the Royal Chest Hospital have been found to contain blood which was invisible to the naked eye. At this hospital 18 patients had hæmorrhagic sputum; 5 had little or no expectoration, leaving only 6 with no note of bleeding. The presence of carcinoma cells is of some interest in clinching a clinical diagnosis. Very rarely a fragment of growth is coughed up and available for section. One patient here did this three times and on one occasion the piece was large enough nearly to choke her. Isolated malignant cells are always difficult to identify, but after having studied the sputum in a few cases of pulmonary carcinoma, I think that with more experience they will be recognised more frequently than heretofore. In two recent cases the examination of the sputum revealed carcinoma cells while the clinical diagnosis was still doubtful. The procedure is simple and takes no longer than looking for tubercle bacilli in a series of specimens. Search must be made on several occasions and at least two portions of the same specimen examined. I simply make a wet preparation stained with thionin blue and examine at once. The observations are too few to enlarge at present on the nature of the cells and naturally many controls are necessary.

Dr. Hunt refers to the frequency of pleurisy as a complication of pulmonary tumours, but his figures do not bring out the fact that it is a *constant* feature of the condition; they presumably refer to the clinical diagnosis and not to the total incidence as revealed post mortem. Out of 20 post-mortems at the Royal Chest Hospital every case showed extensive pleural adhesions. In 13 there was also a large effusion of clear or cloudy fluid; in 4 the fluid was hæmorrhagic, in 5 it was purulent, and in 8 there was invasion of the pleura by new growth.

I have not found that the large cell sometimes called "foulis" is pathognomonic of pulmonary tumour. The same pale vacuolated cell is found in other forms of pleural effusion and it has no resemblance to the malignant cells obtained if a pleural nodule is scraped. The only certain test of carcinoma in pleural fluid is the presence of columnar or spindle cells, and this is uncommon. Binucleate cells or plaques of endothelial cells forming rosettes indicate a lesion of the pleura not necessarily malignant, and are found in inflammatory conditions. A hæmorrhagic fluid is very suggestive of carcinoma but occurs in only about a quarter of the cases and the diagnosis cannot depend upon its presence.

I am, Sir, yours faithfully,
NORAH H. SCHUSTER, M.B., Ch.B.

Royal Chest Hospital, City-road, E.C., April 15th, 1929.

THE ÆTIOLOGY OF UROLITHIASIS.

To the Editor of THE LANCET.

SIR,—Having read with interest Dr. Clifford Hoyle's instructive article in your issue of April 6th (p. 734) I think his suggestion as to the ætiology of urolithiasis in tropical countries is based on a fallacy. It appears to me that Europeans in the tropics suffer through over-protection from ultra-violet rays. Most of the solar radiation is absorbed in the clothing, where it is converted into heat and conducted to the body with enervating effect, the skin beneath remaining absolutely white. Fear of insolation leads to the covering of the head and shading of the face, so that the majority of the Europeans have pale faces. Urolithiasis in the tropics appears to me likely to be the result of excessive sweating and therefore high concentration of the urine. In any case, when we consider that two ounces of cholesterol contain only one grain of ergosterol it is hardly conceivable that a toxic dose of vitamin D could arise from the irradiation of the face and hands alone.

I am, Sir, yours faithfully,
G. MURRAY LEVICK.

Harley-street, W., April 15th, 1929.

ACTIVE IMMUNISATION AND DIPHTHERIA.

To the Editor of THE LANCET.

SIR,—Dr. Goodall expresses the opinion that the suspicious cases of "local diphtheria," referred to in our paper, should have been counted as cases arising in 1928 subsequent to prophylactic inoculation. His letter is evidence that these cases should have been included, since it was politic to avoid any "attempt to gloss over a failure." Our phrase "suggested a diagnosis" is admittedly unsatisfactory since, when used by an expert of Dr. Goodall's unrivalled experience, it conveys a much higher probability that the patient is suffering from the clinical entity "suggested," than when used by someone with only the same amount of experience as (say) myself.

The subject of the diagnosis of these doubtful cases is of great scientific interest, but much too lengthy to discuss here. I hope my attitude with regard to them will be more intelligible when the full report of this Greenwich work is published. Dr. Goodall asks: Would these local cases, which were excluded from the 1928 diphtheria notifications, have been notified if they had arisen in unimmunised boys? Prior to 1922 the answer is, Yes. Since that date, as more and more confidence was gained in the reliability of the Schick test, both as a diagnostic and prognostic instrument, it has gradually become the local custom, for practical purposes, not to diagnose doubtful cases with no marked malaise and negative Schick tests as diphtheria, even in cases where virulent *C. diphtheriæ* are demonstrated on culture. This is the best routine for the special environment in question, even should its biological basis be proved unsound. Since the school was immunised, only the two cases Dr. Goodall mentions come into this category, and I do not think that they were either severe enough or numerous enough to vitiate the conclusions which were reached on the value of the alleged prophylactic inoculations. A further three and a half months have passed since the report under discussion was written, and no other definite, doubtful, or "local" types of diphtheria have come under observation.

Dr. May and I are grateful to Dr. Goodall for putting his finger on the weak spot in our paper, considered as propaganda, but it is difficult always to avoid making dogmatic statements or expressing unorthodox opinions in a preliminary note on a complex investigation.

I am, Sir, yours faithfully,
SHELDON F. DUDLEY.
R.N. College, Greenwich, April 13th, 1929.

URÆMIA SIMULATING ACUTE INTESTINAL OBSTRUCTION.

To the Editor of THE LANCET.

SIR,—An account of a case of uræmia simulating acute intestinal obstruction was given in your issue of Jan. 19th (p. 128) by Dr. Leslie Cole. The more carefully I read through it the more I thought the case to be rather one of intestinal obstruction simulating uræmia. Again in your issue of Feb. 23rd (p. 416) under the same heading Dr. Leslie Smith and Mr. Kenneth Heritage described a case of definite organic obstruction of the bowel with symptoms of uræmia—namely, coma and abnormal increase of blood-urea. Dr. Cole's case had only impacted fæces obstructing the bowel without any kink, band, or the like, and regular catheterisation led to the fall of urea content of blood. With the exception of this and of the high urea content there was hardly any sign of uræmia; the high urea content could easily be explained by the intestinal obstruction without entertaining the hypothesis of uræmia, and the fall of urea attributed to catheterisation might have taken place without it. Both these are clearly cases of intestinal obstruction with some symptoms (if at all) of uræmia and not uræmia with symptoms of obstruction of the gut, as the heading would have us believe.

An interesting suggestion is made by Dr. Smith and Mr. Heritage that the increase in the blood-urea is due to active hyperfunction of the liver resulting in the formation of a larger amount of urea from the toxic intermediate products of proteids absorbed from the obstructed gut, but in pyloric obstruction with vomiting blood-urea may increase, obviously without such absorption taking place to explain the hyperfunction, and the formation of the larger amount of urea. A more plausible explanation which I have read somewhere would be that in prolonged vomiting or in intestinal obstruction there is less water absorbed, resulting in increased concentration of urea in the blood. This theory is only more plausible than that of liver hyperfunction, but not very satisfactory. To accept it means to pronounce discredit to the healthy kidneys' capacity to maintain the composition of blood, in conditions of lessened water absorption from the gut, by secreting a smaller quantity of concentrated urine, which allows urea to pass out and retains more water in the blood, preventing increased concentration of the urea in it.

Beaumont and Dodds, in "Recent Advances in Medicine," mention the occurrence of nitrogen retention in the blood in certain abdominal conditions, and also suggest the simple and efficient means of diagnosis of such condition from renal defect causing nitrogen retention by estimating urea in urine. In neither of the cases of uræmia simulating intestinal obstruction the urea of the urine seems to have been estimated which might otherwise have shown the raised blood-urea to be due to some extrarenal cause. Beaumont and Dodds, however, do not, as far as I know, point out in that book the cause of nitrogen retention in the abdominal conditions. I wish they could be induced to let us know what they think best explains the high blood-urea figure in intestinal obstruction or other acute abdominal condition.

I am, Sir, yours faithfully,
G. B. MANKAD, M.D. Bom.
Ahmedabad, India, March 26th, 1929.

THE DANGEROUS DRUGS REGULATIONS.

To the Editor of THE LANCET.

SIR,—The recent case in the coroner's court in which a motor-bus driver caused the death of two pedestrians owing to a temporary feeling of dizziness while he was at the wheel, forcibly draws attention to the stupidity of the present regulations under the Dangerous Drugs Acts. The driver confessed to having taken 28 drops of chlorodyne on an empty stomach to cure a cold and lost control of his vehicle while under the influence of the drug.

There can be few members of the medical profession who have not found the recent regulations with regard to heroin and cocaine when prescribed, even in the minutest of doses, both annoying and vexatious, and it seems astonishing that morphia should not have been included. If we are to write elaborate prescriptions for the quite irrecoverable amounts of heroin in the simple cough mixtures, linctuses, and lozenges that have given relief for so many years, it seems stupid that we are not bound to do so for the more dangerous drug morphia. That this is a sop to the patent medicine trade is quite obvious, but, at the same time, when morphia in the form of chlorodyne can be bought freely and be taken in sufficiently large doses by the general public as to endanger the lives of others, it is time equally drastic regulations were made for its use.

Most chemists know of customers who come frequently to buy chlorodyne in quantities far above their normal requirements, and there is no doubt that it is abused by morphiomaniacs. Several of my patients who for years had been getting simple heroin or cocaine lozenges and found that these prescriptions were useless after Jan. 1st, expressed the opinion that these regulations were made by the medical profession in order to obtain more consultations. The injustice of the accusation was palpable but difficult to explain away when one of them pointed out that it is still possible to obtain opium-bearing medicines without a prescription.

I am, Sir, yours faithfully,
C. BERKELEY WAY, M.B., B.S. Lond.
Finchley-road, N.W., April 13th, 1929.

CIVIC PRESENTATION TO A MEDICAL MAN.—Lieut.-Colonel Edwin Goodall, medical superintendent of the Whitchurch Mental Hospital, Cardiff, was presented by the Lord Mayor of that city, Alderman W. R. Williams, on April 8th, with an illuminated address from the council on his retirement after 23 years' service. Tributes to the good work which Dr. Goodall had done at the mental hospital were made by several members of the council and the appreciation of the corporation and citizens was emphasised. Mention was made of the fact that when Dr. Goodall was medical superintendent of the Joint Counties Asylum at Carmarthen he had mastered the Welsh language in order to be able to get into closer touch with Welsh patients. In his reply the recipient expressed his pride in being so long associated with a city that had been progressive enough to anticipate coming changes in organisation for the treatment of mental disease by establishing an out-patient clinic in connexion with the Royal Infirmary, while provision had been made for a department of nervous and mental diseases at the hospital now being erected at Llandough. Dr. Goodall and his colleague, Dr. H. A. Scholberg, were afterwards the guests of the Lord Mayor at luncheon in the City Hall.

Public Health Services.

AN OUTBREAK OF IMPORTED SMALL-POX.

A SEVERE type of small-pox has reached this country by sea from India. On March 27th a seaman was landed at Marseilles from an Anchor Line steamship and died the same day from small-pox which had not, it is stated, been recognised as such up to the time he was admitted to the French hospital. The steamship was the *Tuscania* which left Bombay on March 14th, after a stay of a week or more in that port, with a total complement of nearly 1000. Some 200 of the passengers left the liner at Marseilles on March 27th and travelled direct to London or elsewhere, the majority remaining on board as far as Liverpool. The seaman who was landed and died at Marseilles had, it appears, been ill from March 17th, and on March 18th another member of the crew fell ill but was not landed at Marseilles. On arrival at Liverpool, however, on April 1st he was removed to hospital along with several contacts. As soon as possible after leaving Marseilles every person on board (including about 200 children) was vaccinated, or revaccinated, with the least possible delay. On reaching Liverpool some 650 passengers disembarked, information being sent by the port authorities to the districts to which they were stated to be proceeding. Several passengers subsequently proceeded on the vessel to Glasgow, where the crew were disembarked. The authorities at Liverpool also informed the local authorities of the destination (as far as known) of the 200 persons who left the ship at Marseilles and travelled overland.

The Ministry of Health states that the central and local health departments in this country are proceeding on the customary lines in regard to notification, isolation, and disinfection, keeping contacts as far as possible under supervision. It was, however, anticipated that a number of secondary cases would occur in persons who had not been adequately vaccinated before their contact with the infection. Up to the time the official statement was issued on Saturday last some 35 cases of this imported infection were notified in London and elsewhere, among whom five deaths occurred. Later reports indicate that two more members of the crew fell ill in Glasgow, one seriously, and a mild case of small-pox was reported from Keighley in a member of the ship's orchestra. No fresh case among the *Tuscania* contacts has been reported to the Metropolitan Asylums Board this week. As we go to press the figures stand at 42 secondary cases with 6 deaths.

A GUIDE TO MEDICAL INSURANCE PRACTICE.

MEDICAL insurance practice has a tendency to grow more and more complicated as the years go by; with amending Acts and new regulations the maze thickens, and there is a correspondingly greater need for elucidation and guidance of the insurance practitioner. It might be just possible for him to sort them out from a mass of papers issued by the Ministry of Health through the Stationery Office, but this unfruitful labour has been rendered superfluous by the combined work of a (late) assistant secretary in the Ministry and a barrister-at-law. The first edition of "Medical Insurance Practice," by Mr. R. W. Harris and Mr. L. Shoeten Sack, appeared six years ago,[1] and received immediate acceptance as a compendium at once authoritative and readable. The third edition, which has just been issued by the British Medical Association (price 3*s*.), and has received the approval of the National Insurance Defence Trust, has been brought fully up to date in matter and format. The first three chapters deal with the relationship of the insurance practitioner to the insurance committee on the one hand, and the insured person on the other; marginal references to later chapters furnish a ready means of reference to points of difficulty as they may arise. Next are set out the practitioner's duties towards insured persons who are on other doctors' lists or who have not chosen a doctor at all. The definitions of sudden emergency and availability are discussed at useful length. The next chapter explains how the list of insured persons for whom a practitioner is responsible is limited to a certain number fixed by the allocation subcommittee. Then follow the responsibilities and duties of deputies, and assistants and partners. Chapter VII. reviews the range of general practitioner treatment; decisions are quoted on cases regarded as within/without the scope of medical benefit. The obligation to visit and the providing of anæsthetics is gone into well and fully; the cases in which a fee may/may not be charged are defined. The question of prescribing leads on to the compilation of the National Formulary. A whole chapter is devoted to the difficult question of certification, examples being given of the irregularities which have been dealt with in official decisions. The record cards are described, and their purpose is clearly shown in a separate section. An important chapter is devoted to the regional scheme and the relations of practitioners to the regional medical officers. The basis of remuneration is fully explained, with the constitution of the various funds. The investigation of complaints, and the method of appeal to the Minister is next dealt with, and finally the disciplinary action which may be taken by the Minister is described. In addition, there are many valuable appendices.

The book, as we noted on its first appearance, makes a pleasant appeal to the medical reader by addressing him or her in the second person, and when emphasis is needed it is laid by means of black type more elegant than the italics of former editions. The conversational style conceals, but does not impair, the legal precision of what may be regarded as an essential guide for the insurance practitioner in the proper conduct of his practice.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 6TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 273 (last week 323); scarlet fever, 1801; diphtheria, 1011; enteric fever, 43; pneumonia, 2158 (last week 2425); puerperal fever, 34; puerperal pyrexia, 112; cerebro-spinal fever, 13; acute poliomyelitis, 7; acute polio-encephalitis, 1; encephalitis lethargica, 24; dysentery, 6; ophthalmia neonatorum, 88. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on April 9th–10th was as follows: Small-pox, 162 under treatment, 10 under observation (last week 163 and 0 respectively); scarlet fever, 1554; diphtheria, 1795; enteric fever, 12; measles, 96; whooping-cough, 1209; puerperal fever, 24 (plus 6 babies); encephalitis lethargica, 81; poliomyelitis, 4; "other diseases," 61. At St. Margaret's Hospital there were 12 babies (plus 7 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was 1 death from small-pox, 2 (0) from enteric fever, 56 (3) from measles, 5 (1) from scarlet fever, 154 (54) from whooping-cough, 29 (5) from diphtheria, 57 (16) from diarrhœa and enteritis under two years, and 328 (48) from influenza.

The death provisionally classified to small-pox was assigned to West Ham. Great towns reporting ten or more deaths from influenza were Birmingham, 21; Bradford and Sheffield, 10 each. Birmingham and Liverpool each reported 10 deaths from measles, West Bromwich 7. Whooping-cough deaths are still widely distributed, with the highest figures reported from Birmingham, 11; Manchester, 8; Liverpool, 7; West Ham and Hull, each 6. No great town reported more than 5 deaths from diarrhœa, Manchester alone having as many.

The number of stillbirths reported during the week was 296 (corresponding to a rate of 44 per 1000 births), including 45 in London.

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[1] See THE LANCET, 1922, ii., 982.

THE SUPPLY OF RADIUM.

OFFICIAL PROPOSALS AND RECOMMENDATIONS.

THE Report[1] of the Radium Subcommittee of the Committee of Civil Research, appointed in July, 1928, has now been issued. The subcommittee, which was charged to examine the radium requirements of Great Britain in relation to the present sources of supply and to submit recommendations, consisted of the following persons :—

Lord Rayleigh (chairman); Sir Sydney Chapman, Chief Economic Adviser to H.M. Government; Mr. H. L. F. Fraser, Assistant Secretary, Department of Health for Scotland; Sir Walter Fletcher, Secretary, Medical Research Council; Lieutenant-General Sir Webb Gillman, Master-General of the Ordnance, War Office; Mr. J. F. N. Green, Assistant Secretary, Colonial Office; Mr. M. Heseltine, Assistant Secretary, Ministry of Health; Sir Thomas Holland, Director, Geological Survey of India, 1903–1909; Sir George Newman, Chief Medical Officer, Ministry of Health; Sir Robert Robertson, Government Chemist; Sir Ernest Rutherford, President of the Royal Society; Mr. H. T. Tizard, Secretary, Department of Scientific and Industrial Research; with Mr. A. F. Hemming (Assistant Secretary to the Committee of Civil Research), as Secretary.

The Report starts with a clear summary of the position to which radium has now attained in medical treatment, the conclusion being come to that the best radium practice in Great Britain is now as good as that in any country. This view is substantiated by a reference to the technical methods elaborated for the treatment of cancer by radium in almost every region of the body except the stomach, and adopted for application either in greatly improved ways or following new devices. "Of the various forms of cancer," the Report here runs, "for which radium has been tried, none affords a more striking example than cancer of the womb." The number of women who died of this form of cancer in 1926 is quoted as 4409, and, says the Report, "there can be little doubt that if there had existed an adequate supply of radium in this country available for medical treatment, the lives of many of these women might have been prolonged, and much suffering avoided."

Supply and Demand.

The Report goes on to analyse the existing supply of radium available for treatment in Great Britain and the methods adopted for its distribution. The Medical Research Council hold the equivalent of approximately 2·4 grammes of radium element, the bulk of which is distributed on loan to hospitals which have submitted approved schemes of research, a fraction only being allocated for purposes of experiment. An important fraction is retained centrally at the Middlesex Hospital as a source of supply of radium emanation (radon), the expenses of this radon centre being defrayed by a grant from the British Empire Cancer Campaign. An estimate is added of the amount of radium possessed by other institutions than those subsidised by the Medical Research Council and by private practitioners, and of the private radium stock in Scotland. It is shown, then, that the total available from all sources in Great Britain is approximately 24·9 grammes, of which 22·7 grammes are distributed unevenly over England and Wales, and 2·2 grammes are held in Scotland. The estimated need for the country is 50 grammes.

The sources of radium production in the world are stated with a caution as to the difficulty of making a trustworthy estimate; at the present time very little radium is being produced anywhere except in Belgium where the Belgian Congo ore is treated.

The attempt to arrive at the cost of production placed before the Subcommittee some very complex problems, and as the existence of new sources become indicated, in the British Empire and elsewhere, it may be possible to produce radium later in commercial quantities at an economic price. But time must elapse before this contingency arises, and in the meanwhile any considerable addition to the stock of radium available for medical purposes in this country will have to be derived from the Belgian producers. For this object a body of National Trustees will be appointed (see below), and it is suggested that if purchases can be made through a single agency it might be possible to buy at a substantially lower figure than the present retail price of £12 a milligramme.

Summary of Conclusions.

The Subcommittee summarise their conclusions as follows :—

(1) Knowledge of the biological and curative properties of radium for the treatment of cancer and of the technique of its application has advanced very rapidly in recent years and has greatly increased, and is likely still further to increase, the amount of radium required for medical purposes in Great Britain.

(2) The amount of radium belonging to the Government which is available for medical purposes in England, Scotland and Wales is 2·2 grammes, and the estimated amount believed to be the property of hospitals and private medical practitioners, or likely so to be in (say) three months' time, is approximately 22·7 grammes, making a total of 24·9 (or say 25) grammes.

(3) The amount required to meet existing needs in Great Britain is probably approximately 49 or 50 grammes—i.e., an immediate addition of about 24 grammes to the existing national stock is required.

(4) Owing to the lack of trained personnel and to the inadequacy of the available hospital accommodation it is probable that not more than 20 additional grammes of radium could be effectively absorbed for medical purposes by the end of 1930.

(5) Full advantage can be obtained from a given quantity of radium only when it is constantly in application—i.e., when it can be transferred from one patient to another with a minimum of delay. Such conditions are only to be found in centres possessing the necessary specialist personnel, technical equipment, and available beds.

(6) There is at present no common policy between the hospitals in acquiring radium, hospitals buying such quantities as the resources at their disposal or local munificence render possible, with the result that existing private stocks of radium have been acquired for particular localities without reference to the needs of the country as a whole.

(7) There exists a pressing need for the establishment of a central stock of radium and the organisation of some systematic method for its distribution.

(8) Until sources of supply at present unproved or unknown are discovered in the Empire or elsewhere, the only source from which additional supplies of radium for medical purposes is obtainable in any quantity is the Belgian Congo.

(9) If an organisation such as that referred to in (7) above was established it should be possible for it to obtain radium for substantially less than the existing market price, as it would be in a position to arrange large purchases spread over a considerable period.

(10) Such an organisation should also be given powers not only to purchase radium for its own purposes but also to act, when so requested, as a buying agent for hospitals and other institutions in this country or for Dominion or Colonial Governments.

(11) The amount of radium required by the Government for the Fighting Services and for use in physical research is relatively so small that it would be a mistake to require that additional radium needed for these purposes should be bought through the agency of any organisation that may be established for medical purposes.

Recommendations.

In the light of these conclusions, the Subcommittee submit the following recommendations in regard to the medical use of radium for the consideration of the Committee of Civil Research :—

(1) Steps should be taken at once to ensure the acquisition by instalments of 20 additional grammes of radium element for medical purposes.

(2) A body of Trustees should be appointed entitled the National Radium Trustees, whose duty it should be to hold the funds provided by Parliament or otherwise, and to purchase therewith and hold radium for use by the Radium Commission referred to in (4) below.

(3) The National Radium Trustees should consist of the following persons :—

The Lord President of the Council, the Minister of Health, the Secretary of State for Scotland, the President of the Royal Society, the President of the Royal College of Physicians of London, the President of the Royal College of Surgeons of England, the Chairman of the Central Liaison

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[1] H.M. Stationery Office. Cmd. 3303. 6*d*.

Committee of Voluntary Hospitals in Scotland, the President of the Royal Society of Medicine, the President of the British Medical Association, and two members to be coöpted, if subsequently so desired, by the National Radium Trustees.

(4) The National Radium Trustees should appoint a body to be called "The Radium Commission," who should have the following powers and duties :—

Generally to deal with the custody, distribution and use of all radium held by the Trustees, having regard to the advancement of knowledge, the treatment of the sick, and economy of use ; and, in particular, to consider and approve plans submitted to them for the use of radium for the purposes of medical treatment and research, and to make the necessary arrangements for the supply of radium for such uses.

(5) The Radium Commission should consist of the following nine persons :—

(*a*) A Chairman, who should be a distinguished public man, not necessarily a member of the medical profession, nominated by the National Radium Trustees ;

(*b*) Four persons nominated by the National Radium Trustees ;

(*c*) Four representatives nominated one each by the Minister of Health, the Secretary of State for Scotland, the Medical Research Council, and the Department of Scientific and Industrial Research.

(6) Members of the Radium Commission should be appointed for a period not exceeding four years, and should be eligible for reappointment after an interval of one year, the Chairman being eligible for immediate reappointment.

(7) The Radium Commission should make arrangements with the National Physical Laboratory for :—

(*a*) The custody of the radium put at the disposal of the Commission by the National Radium Trustees when such radium is not actually in use for medical purposes ;

(*b*) Its preparation in form for use ;

(*c*) Its recovery from such preparation on return from loan.

HOSPITALS IN THE UNITED STATES OF AMERICA.

A RECORD OF PROGRESS.

TWELVE months ago the American Medical Association, through the hospital number of its *Journal*, published its first list of all the hospitals in the United States which conform to its standards. Through the same medium it has now issued its second list, which shows an addition of 45 to the number of recognised institutions, and a total increased capacity of 39,016 beds and 1350 cots. The essentials for admission to the Register, as laid down by the Association, are few in number, but sufficient to ensure efficiency. Every member of the medical staff and every visiting physician must be a graduate of a reputable medical school, and there must always be a competent physician-pathologist either on the staff or easily accessible, who must keep careful records. Full histories and records of every patient admitted must be kept, and it is required that staff conferences, at least monthly, but preferably weekly, should be held where there are staffs of three or more for consultation upon difficult cases, and discussion of the causes of death in fatal cases. Other essentials are "able management" and a sufficient number of nurses, and no hospital must be conducted for profit. When the list was first compiled 462 hospitals and sanatoriums were excluded because they failed in some serious respect to reach the standard.

There are now in the United States 6852 hospitals of all kinds, and in the last 20 years the number of beds has grown by an annual average of 25,000. The total of beds and cots (called in America "bassinets") is 936,247. This gives one bed for every 270 persons, as compared with one for 340 as recently as 1920. The best proportion of population to beds is in Wisconsin, where it is as high as 154. The most backward State, from the hospital point of view, is South Carolina, with one bed to every 749 persons, but it is explained that all the backward States are rapidly being levelled up. The beds in the 5619 "hospitals for community use" had an average rate of occupancy of 69 per cent. Not the least curious fact that emerges from the mass of statistics compiled by the Council of Medical Education and Hospitals is *the progressive decline in the number of maternity* hospitals which have steadily fallen from 202 in *1923 to 164 in 1928.* The explanation is that the general hospitals are growing in favour for maternity work, and last year rather more than 88 per cent. of all the babies born in hospitals were born in general institutions. This percentage represents nearly three-quarters of a million births. Many institutions definitely classed as maternity hospitals are, however, doing a considerable amount of other work. Very much more than half the total number of beds in the American hospitals are in what are there called "Government" institutions, which means institutions owned or controlled federally, or by States, counties, and cities. In so vast a territory as the United States any considerable provision of hospital facilities by the Central Government is obviously impracticable, and it is therefore natural that hospitals run by States should provide the majority of the beds. But with over 1000 hospitals and more than 114,000 beds, the institutions provided by the various religious bodies make a remarkable showing. These hospitals, however, derive some part of their income from other than their own denominational resources, and are consequently unable to confine their ministrations to adherents to their own forms of faith. For the first time a list is given of hospitals in the territorial possessions of the United States. They number 229, with a capacity of 20,650 beds and cots ; 87 of these hospitals, with 10,884 beds, are in the Philippine Islands.

In a note on the educational functions of the hospitals it is pointed out that since 1914 the number of medical college graduates taking a "general internship," or fifth year in medicine, has almost doubled, while the quality of the training has far outstripped the numerical gain, thanks to the introduction of a regular curriculum of teaching and practice in most of the large general hospitals. This improvement is due to the action of the American Medical Association, which in 1914 took medical education seriously in hand as, later on, it created a definite ethical and professional standard for hospitals of all descriptions.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

THE BUDGET.

The House of Commons reassembled on Monday, April 15th, after the Easter recess. Mr. **CHURCHILL**, the Chancellor of the Exchequer, made his annual Budget statement. In the course of his speech Mr. Churchill announced that the existing duties on tea would be repealed from April 22nd. The railway passenger duty would be repealed as from April 1st last. A reduction of one-fourth from Oct. 1st would be made in the excise duties on liquor retailers' on-licences for spirits, beer, &c., subject to a reduced minimum duty. Off-licence holders are to be free to sell half bottles of spirits. Relief to agricultural property from rating will begin this month instead of in October. Increased licence duties are to be imposed on brewers for sale, distillers, and tobacco manufacturers in order to counteract their relief under the de-rating scheme. The duty of 30s. is to apply to motor-cycles up to 224 lb. weight instead of 200 lb. A reduction from £40 to £35 of duty will be allowed for goods vehicles from 2 to 2½ tons, with rebate of 20 per cent. for those fitted wholly with pneumatic tyres. An extension of telephone call offices is provided for at rural post offices and railway stations. An extra grant of 15 per cent. will be made towards road schemes on which half the workers come from depressed areas.

HOUSE OF COMMONS.

MONDAY, APRIL 15TH.

Small-pox on "Tuscania."

Lieut.-Colonel **FREMANTLE** asked the Minister of Health if he would state the numbers respectively of the crew of the s.s. *Tuscania* on her recent voyage from Bombay to

Liverpool and of the passengers landed; whether al the passengers and crew were under observation; what number of cases of small-pox had occurred amongst them; what was the number and vaccination history of the cases that had died; and whether any cases of small-pox had been notified from contacts with such passengers and crew.—Sir K. WOOD (Parliamentary Secretary to the Ministry of Health) replied: My hon. and gallant friend will have seen the statement on this case issued by my department and published in the newspapers on Saturday, and at present my right hon. friend is not in a position to make any further statement.

Mr. T. JOHNSTON asked the Secretary of State for Scotland whether he was aware that a member of the crew of the s.s. *Tuscania* was discharged at Marseilles; whether subsequently a wireless message was received from Marseilles intimating that the man had died of small-pox; whether on arrival at Liverpool the other members of the crew were taken to hospital for small-pox; whether on arrival at Glasgow, and before fumigation or disinfection of the ship, an engineer along with 23 cases of chickens and seven barrels of ducks were transferred to the s.s. *Caledonia*, which sailed for New York on April 7th; whether the Transport Workers' Union informed the port medical authorities of the transfer of the engineer and the foodstuffs from the infected ship prior to the sailing of the *Caledonia;* why nothing was done to prohibit this proceeding; whether 40 bags of flour had since been transferred from the infected vessel to the s.s. *California*, and whether he was in a position to assure the House that all proper steps were being taken to prevent a spread of the infection.—Sir J. GILMOUR replied: I have been unable, in the time available, to obtain information on the detailed matters referred to in this question. I am, however, making inquiries and will communicate the result to the hon. Member after these have been completed. I am satisfied that all reasonable steps are being taken by the competent authorities in Scotland to deal with the position and to protect the interests of the public.

Mr. Johnston asked whether Dr. MacGregor, who was in charge of the health department in Glasgow, had sent any wireless messages to the *Caledonia*, and what the purport of the messages were?

Sir J. GILMOUR said that that was one of the points he could not answer.

Sir R. THOMAS: Is the right hon. gentleman aware that the best medical supervision in the world is obtainable at the Liverpool Docks?

No reply was given to this question.

White Women and Coloured Seamen a Cardiff.

Sir ROBERT THOMAS asked the Home Secretary whether he had now decided to take action as a result of the facts revealed some months ago in the report of the chief constable of Cardiff regarding the association of white women with Asiatic and coloured seamen in the dock district, and, if so, along what lines.—Lieut.-Colonel Sir V. HENDERSON (Under Secretary to the Home Office) replied: The problem is not a new one, and I do not think that any immediate and complete solution of it is possible. As my right hon. friend indicated in reply to a question on Jan. 28th last, certain possibilities are being investigated, but I should prefer not to specify them at present.

League of Nations and Radium Supplies.

Commander BELLAIRS asked the Minister of Health whether the whole of the report of the research committee on the world's radium supplies would be brought before the League of Nations as a matter of international concern.—Sir KINGSLEY WOOD replied: The report of the subcommittee of the Committee on Civil Research is being published, and the point raised by my hon. and gallant friend will be considered in due course.

Birth- and Death-rates in Bengal.

Mr. DAY asked the Under Secretary of State for India whether he could give the birth- and death-rates for the province of Bengal for the 12 months ended to the last convenient date.—Earl WINTERTON replied: The latest figures available are for the calendar year 1926. The rates for births and deaths registered in the Bengal Presidency, excluding the Chillagong Hill tracts, were 27·44, 24·7 per *mille* respectively. As the result, however, of special inquiries instituted in connexion with the census reports it has been estimated that more than 26 per cent. of births and deaths in the province are unrecorded.

TUESDAY, APRIL 16TH.

Government and Radium Supplies.

Dr. VERNON DAVIES asked the Prime Minister whether he was now in a position to state what action the Government proposed to take on the Report of the Subcommittee of the Committee of Civil Research on Radium.—Mr. CHURCHILL (Chancellor of the Exchequer) replied: In view of the importance of the matter, and the public interest attracted by it, the Government arranged for the immediate publication of the Report. It will be seen that the Report deals with the national requirements for radium in medical treatment, in the fighting services, and for the purposes of physical research, and with the possibilities of developing new sources of supply. Further, in a full statement as to the use of radium in medical treatment, the subcommittee indicate that a great volume of avoidable distress and suffering persists simply because the radium required for the treatment of cancer is not available; and that the acquisition of further supplies should encourage the wider development of the highest skill in its use, and the allocation of more hospital beds to the treatment of suitable cases. The subcommittee express the opinion that in order to meet the requirements of England and Wales, and of Scotland, 20 grammes of radium, in addition to the stocks already available, or likely to be available shortly, for general medical use, should be acquired within a specified period—namely, before the end of 1930. The subcommittee recommend that the necessary sum, estimated at £200,000, should be raised by a public appeal to which the Government should contribute pound for pound within that maximum sum. The subcommittee also propose the setting up of an organisation consisting, first, of a body to hold the funds and purchase and hold the radium; and, secondly, of a body to distribute the radium and secure its full use in the manner best adapted to further the advancement of knowledge and the treatment of the sick. As regards the recommendations of the subcommittee on the subject of the organisation, these have been accepted in principle by the Government, but the precise form of the organisation will remain open to further discussion. The Government have accepted the financial recommendation of the subcommittee, and they will be prepared to contribute from public funds, up to a maximum of £100,000, to the extent of £1 for every £1 of private subscription for the purchase of additional radium. The Government confidently expect that there will be no difficulty in raising, in a very short space of time, the funds necessary to provide this invaluable addition to the national resources for dealing with one of the most formidable maladies known to us.

Mr. MACDONALD asked if the Government had considered the effect of this announcement on the price of radium, and if it proposed to take any steps to safeguard itself in that matter?

Mr. CHURCHILL: I understand that all that is dealt with in the Committee's report. The House is entitled to the Report, and therefore publicity is unavoidable, but I do not apprehend any serious evil consequences.

Commander BELLAIRS asked if the Report dealt with the international aspects of radium and made any recommendation to bring the matter before the League of Nations, especially with regard to the Belgian monopoly?

Mr. CHURCHILL said that he must frankly confess that, like Commander Bellairs, he was looking forward to studying the Report.

Lieut.-Commander KENWORTHY asked if the right hon. gentleman was aware that every time the Government had gone into the market to purchase radium the price had been raised against them, and if he would consider the suggestion of Commander Bellairs and advise the Foreign Office to examine into the matter of international action?

Mr. CHURCHILL said that he understood, though he did not speak with first-hand knowledge, that this matter was fully discussed in the report.

Replying to Dr. VERNON DAVIES, who asked if there would be an opportunity to discuss the report, Mr. CHURCHILL said that it did not seem to him that the House was going to have very much opportunity for discussing very much more.

Sir R. THOMAS asked if the report dealt with the potential supply of radium in Australia.

Mr. CHURCHILL: That is covered by the statement that I have not yet been able to study the Report.

Mr. R. MORRISON asked if it would not be necessary for the Government to have a supplementary estimate.

Mr. CHURCHILL replied that whatever was right and necessary would certainly be done.

Mr. W. THORNE asked what was the approximate cost of an ounce of radium.

Mr. CHURCHILL replied that he was sorry that he did not happen to have that information in his mind.

Mr. THORNE: Is the right hon. gentleman aware that the cost is about £400,000 per ounce?

Government and Slum Clearances.

Captain GARRO-JONES asked the Minister of Health when he intended to announce his promised plans for slum clearances.—Sir KINGSLEY WOOD replied: The Government hope to be able to lay proposals before the House next session.

Drug Smuggling at Welsh Ports.

Sir Robert Thomas asked the Home Secretary whether he had any information indicating that drugs were being smuggled into this country on a large scale through the ports of Cardiff and Swansea.—Lieut.-Colonel Sir V. Henderson (Under Secretary to the Home Office) replied: The answer is in the negative.

Drugs from Russia.

Sir P. Cunliffe-Lister (President of the Board of Trade), replying to Mr. Day, stated that last year the declared value of drugs, medicines, &c., consigned from Russia to the United Kingdom was £294,077.

Medical News.

University of Cambridge.—At recent examinations the following candidates were successful:—

Diplomas in Public Health, Hygiene and Tropical Medicine. *Part I.*—W. J. C. Auld, R. F. Campbell, G. L. Chadha, Katherine M. Douglas, Bessie G. Jemson, B. F. Lewin, A. P. Martin, R. M. Mathew, L. N. Mathur, Isabel D. Patterson, S. W. Savage, A. G. Shanks, and L. R. Sharma.

University of London: *Forthcoming Lectures.*—Three lectures on the Drug-like Actions of Some Food Constituents will be given by Prof. E. Mellanby, F.R.S., at University College, Gower-street, W.C., at 5.15 P.M., on April 29th and 30th, and May 1st.—Prof. A. Brachet, of Brussels, will lecture on Experimental Embryology at University College, at 5.30 P.M., on Tuesday, May 28th, Wednesday, the 29th, and May 31st.—Two lectures on the Physiology of Glycogen will be delivered by Prof. J. J. R. Macleod, F.R.S., at the London Hospital Medical College, at 5.30 P.M., on Thursday, May 16th, and Friday, the 17th.—Two lectures on the Psychology of Dementia are to be given in English by Prof. E. D. Wiersma, of Groningen, at University College, at 5.30 P.M., on Wednesday, May 29th, and the following day.—Six lectures on Special Sense Physiology will be given by Mr. R. J. Lythgoe at University College, at 5 P.M., on Thursdays, May 2nd, 9th, 16th, 23rd, 30th, and June 6th.—Prof. S. J. Cowell will deliver six lectures on Dietetics at St. Thomas's Hospital, at 5 P.M., on Thursdays, May 2nd, 9th, 16th, 23rd, 30th, and June 6th.—Two lectures on Some of the Sequels of Epidemic Encephalitis (Lethargica) will be given by Prof. A. J. Hall at University College, at 4 P.M., on Fridays, May 3rd and 10th. Admission to all these lectures will be free, without ticket.

Applications for grants from the *William Smythe Hughes Medical Research Fund* must be received in proper form between May 1st and June 15th. Further particulars may be had from the Academic Registrar.

A University *Studentship in Physiology* of £100 a year will be awarded to a suitable candidate who applies on or before May 31st.

University College, London.—The annual dinner of the Fellows will be held at the College on Tuesday, April 30th, at 7.15 for 7.30, in commemoration of the laying of the first stone of the College buildings by the Duke of Sussex on April 30th, 1827. Prof. F. W. Oliver, F.R.S., who was elected a Fellow in 1886, will preside.

The fund being raised in connexion with the centenary of the College has two main objects—to provide £200,000 for buildings and equipment, and £300,000 for endowment. Rather more than £212,000 has so far been received

University of Leeds.—Three courses of post-graduate lectures will begin on May 1st. Dr. H. W. Davies will lecture on Acidosis, Alkalosis, and Ketosis, at the School of Medicine, Thoresby-place, Leeds, at 3 P.M. on Wednesdays; Mr. A. Richardson will lecture on Emergency Surgery at the General Infirmary on the same day at the same hour; and Prof. W. H. Maxwell Telling will lecture on Diseases of the Ductless Glands at the General Infirmary at 4.30 P.M. on Wednesdays.

A fortnight's general course of clinical instruction and lectures will be given at the General Infirmary and the School of Medicine from July 1st. Details may be had from the Dean of the School of Medicine.

University of Dublin.—The lecturer appointed for this year, Dr. Louis E. J. Werner, will deliver the Mary Louisa Prentice Montgomery Lecture in Ophthalmology in the School of Physic at 5 P.M. on Thursday, April 25th. His subject will be the Slit Lamp in Clinical Practice.—Arrangements have been completed for the holding of the usual three weeks' post-graduate course from Sept. 16th to Oct. 5th. As in former years, as far as possible practitioners attending the course will be able to live in college chambers.—A short course of lectures in anæsthetics will be given this term for medical students in their final year by Dr. T. P. C. Kirkpatrick, the University lecturer in anæsthetics. This course is intended to supplement the theoretical and practical instruction which is given at the clinical hospital.

Royal College of Surgeons of England.—At a quarterly meeting of the Council held on April 11th, Lord Moynihan, President, in the chair, a vote of condolence on the death of Sir Anthony Bowlby, past President and past Member of the Council, was passed.—It was decided to expend Lord Beaverbrook's grant of £1000 upon tissue culture research.—The honorary gold medal of the College was awarded to Sir George Makins in appreciation of his valuable services to the College, more especially in arranging and describing the series of drawings in the Army Medical War Collection.—The Jacksonian prize for 1928 was not awarded, the essay received not being of sufficient merit to justify the award. The subject of the essay for 1930 is the Pathology of Ovarian Cysts and its Bearing on Their Treatment.

The following were elected to the Fellowship as Members of 20 years' standing, viz.: Mr. Comyns Berkeley, obstetric and gynæcological surgeon, Middlesex Hospital; and Prof. W. Blair Bell, obstetric and gynæcological surgeon, Liverpool Royal Infirmary.—The President reported that the vacancy on the Court of Examiners occasioned by the retirement of Sir Cuthbert Wallace, whose term of office has expired, would be filled up at the next meeting of the Council.—The Licence in Dental Surgery was conferred upon Max L. Cooper, Cape and Guy's, who has passed the requisite examinations and has complied with the by-laws of the College.

Fellowship of Medicine and Post-Graduate Medical Association.—The Fellowship will hold its first course of instruction for the M.R.C.P. examination from May 7th to June 28th. This will consist of 16 lectures, each delivered at 8.30 P.M., at 11, Chandos-street, Cavendish-square, W. A detailed syllabus will be sent on application to the secretary of the Fellowship, at 1, Wimpole-street, W. 1. On April 29th a three weeks' course on diseases of the throat, nose and ear will start at the Central London Throat, Nose and Ear Hospital. Beginning on the same date is a month's course in psychological medicine at the Maudsley Hospital. From May 6th to June 1st there will be a course in venereal diseases at the London Lock Hospital, and from May 2nd to June 1st the London School of Dermatology will hold a special course of clinical instruction in the out-patient department, with formal lectures on fixed dates. From May 27th to June 8th an afternoon course, under the direction of Dr. Eric Pritchard, will be held at the Infants Hospital.

The World League for Sexual Reform.—The Third International Congress of the World League for Sexual Reform will be held in London, under the presidency of Dr. August Forel, Mr. Havelock Ellis, and Dr. Magnus Hirschfeld, from Sept. 9th to 13th next. The subjects for discussion are: (1) Marriage and divorce; (2) birth control, abortion, and sterilisation; (3) prevention of venereal disease and prostitution; (4) sex and censorship; while one day's proceedings will be devoted to papers on various subjects which do not come under these headings. The languages of the Congress will be English, French, German, and Esperanto. Those who wish to read papers are requested to notify at once Dr. Norman Haire, the hon. secretary, 127, Harley-street, London, W., and any communications for the sections must reach him not later than July 1st. Subscriptions to the Congress and donations for preliminary expenses will be gratefully received by the hon. treasurer, Mrs. Dora Russell, at Telegraph House, Harting, Petersfield, Hants.

Tavistock-square Clinic for Functional Nervous Disorders.—The annual general meeting will be held in the form of a luncheon at the Hotel Russell, Russell-square, London, W.C., on Monday, May 6th, at 1 o'clock. for 1.10 P.M. Sir Frederick Willis will preside; Dr. H. Crichton Miller, the honorary director, will present a report; and Sir Philip Gibbs will be among the other speakers. Supporters of the Clinic are invited to bring guests to the luncheon, tickets being obtainable from Miss Hollingsworth at the Clinic, 51, Tavistock-square, W.C.1.

Kensington, Fulham, and Chelsea General Hospital.—A dinner will be held at the Mansion House, London, by permission of the Lord Mayor, on Tuesday, April 23rd, having for its object the raising of a fund for the rebuilding of this hospital. The Marquis of Carisbrooke will preside and Dame Madge Kendal will be amongst the speakers. The institution is in urgent need of rebuilding, while the shortage of beds and of accommodation for out-patient treatment is extreme in the neighbourhood. The estimated cost of the rebuilding is £70,000, of which £20,000 has been already subscribed.

Royal College of Physicians of Ireland.—At a meeting of the College on April 5th the following were elected Fellows: Nicholas Marshall Cummins, Robert Constable Cummins, and Robert Elsworth Steen.

Lord Dawson of Penn has promised to distribute the prizes and certificates to students of the London Hospital Medical College on Friday, June 28th.

National Association for the Prevention of Tuberculosis.—The fifteenth annual conference of this Association will be held from Oct. 10th to 12th at Newcastle-upon-Tyne. The Association's address is: 1, Gordon square, London, W.C.1.

Royal Sanitary Institute.—A sessional meeting will be held at 3 P.M. on Friday, April 26th, in the City Hall, Cardiff, when Dr. Ralph Picken and Dr. E. Colston Williams will open a discussion on the New Local Government Act. There will also be discussions on Town Planning and the Proposed Reconstruction of Cardiff Bridge.

Medico-Legal Society.—A meeting of this society will be held at 11, Chandos-street, Cavendish-square, W., at 8.30 P.M., on Thursday, April 25th, when Lord Riddell will read a paper on the Sterilisation of the Unfit. The Earl Russell, Dr. Nathan Raw, Dr. R. A. Gibbons, Dr. W. R. K. Watson, and Dr. T. B. Hyslop will take part in the subsequent discussion.

Dr. Jessie Macgregor Memorial Prize.—An award of this prize, of the value of £75, will be made in July to the applicant who presents the best record of original work in the science of medicine. Such work must not have been published earlier than July, 1926. The prize is open to medical women who are medical graduates of the University of Edinburgh, or who have taken the Triple Qualification, and who before qualification have studied medicine for at least one year in Edinburgh. The successful applicant will later deliver a lecture on the subject of her work. Applications marked "Dr. Jessie Macgregor Prize in Medical Science" must reach the Convener of Trustees, Royal College of Physicians of Edinburgh, not later than May 31st.

Hospital Coöperation.—The Special Committee of King Edward's Fund, which is considering the relations between voluntary hospitals and municipal hospitals under the new Local Government Act, is taking definite steps for the establishment of an organisation in the London area for consultation with the London County Council. The British Hospitals Association is arranging for the creation of similar organisations outside London.

Charing Cross Hospital.—At the annual general court of the governors of this hospital last week it was claimed that it is "still the most economically run hospital in London." It is intended during the year to equip the adjoining premises purchased from the Westminster Ophthalmic Hospital, and the out-patient and casualty departments are being enlarged. It is also hoped shortly to rehouse the whole of the nursing staff, and to provide tennis courts, a garden, and private transport.

King Edward's Hospital Fund for London.—Mr. H. W. Marshall has given to King Edward's Hospital Fund £13,000 Japan 4 per cent. Bonds to be added to the "family fund" inaugurated by him in 1927. In 1927 Mr. Marshall, who had also given the Fund freehold property valued at £12,000, presented the Fund with £10,000 3½ per cent. Conversion Stock, and this was augmented last year by a legacy of £3711 from Miss Elizabeth Marshall, sister of the donor. The "Marshall Fund" is the first "family fund" to be created for the benefit of the King's Fund, and was inaugurated by Mr. Marshall in the hope that others might follow his example.

Royal Westminster Ophthalmic Hospital.—This hospital will hold a festival dinner at the May Fair Hotel on Thursday, May 2nd, in celebration of its transference to the new premises in Broad-street, Holborn. The hospital is now in its 112th year and £50,000 is still required to meet the cost of the new building and its equipment, and the higher cost of maintenance. The number of in-patients is now equal to that of the old hospital, and there are also 14 private rooms for paying patients. Eventually the hospital will accommodate 100 persons requiring beds after operations. A new feature of the hospital is a ward for 12 children. Out-patients from the London area attend at the rate of 40,000 a year, and there are facilities for students of ophthalmology.

British Hospitals Association.—The Prince of Wales has accepted the invitation to become Patron of this Association. His Royal Highness explains that he has done so in the belief that he may encourage friendly coöperation between the Association and the King's Fund, of which he is President.

Infant Mortality in Straits Settlements.—From an official report it appears that in Singapore infant mortality has dropped by one-half since 1911, an improvement mainly attributed to the strides which have been made in antimalarial measures.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Monday, April 22nd.—8 P.M., Odontology. Casual Communications: Mr. G. Northcroft: The Migration of a Foreign Body. Mr. G. Thomson: Hyperplasia and Hypoplasia. Mr. E. A. Hardy: A Possible Pitfall in a Purely X Ray Diagnosis of a Fractured Mandible. Paper: Mr. Sheldon Friel: The Relation of Function to the Size and Form of the Jaws.

Tuesday,—5 P.M., Medicine. Short papers: Dr. O. Leyton: How Can We Decide Whether a Case of Glycosuria Should be Treated? Dr. W. T. Munro: Pulmonary Tuberculosis Due to Bovine Tubercle Bacilli. Discussion will follow.

Thursday.—5.30 P.M., Urology. Paper: Dr. P. J. Cammidge: Prostatectomy in Diabetics.

Friday.—5 P.M. (Cases at 4.30 P.M.). Disease in Children. 8 P.M., Epidemiology. Paper: Dr. J. Gordon Thomson: Endemic Malaria in Southern Rhodesia.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.

Monday, April 22nd, to Saturday, April 27th.—Queen Mary's Hospital, Stratford, E. Wed., at 2 P.M., Antenatal Demonstration by Mr. L. C. Rivett.—St. John's Hospital for Diseases of the Skin, Leicester-square, W.C. Thurs., at 2 P.M., O.P. Demonstration by Dr. W. K. Sibley. The above are free.—London School of Hygiene and Tropical Medicine, Endsleigh-gardens, W.C. Tues. and Thurs., at 2 P.M., Lecture-demonstration.—Royal Free Hospital, Gray's Inn-road, W.C. Wed., at 5.15 P.M., Lecture-demonstration.—Royal Waterloo Hospital, Waterloo-road, S.E. Special Course in Medicine, Surgery, and Gynæcology.—West End Hospital for Nervous Diseases, Welbeck-street, W. Daily, at 5 P.M., Lecture-demonstrations illustrated by cases. Further information from the Fellowship of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

Monday, April 22nd.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

Tuesday.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

Wednesday.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

Thursday.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.

Friday.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

Tuesday, April 23rd.—3.15 P.M., Dr. E. H. Shaw: Tumours.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.

Wednesday, April 24th.—4 P.M. (at St. John's Hospital, 49, Leicester-square, W.C.), Clinical Cases. 5 P.M., Dr. Roxburgh will open a discussion on Alopecia Areata.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL.

Monday, April 22nd.—1.30 P.M., Hearing Tests.

Wednesday.—1.30 P.M., Examination of the Larynx.

Friday.—1.30 P.M., Examination of the Mouth and Pharynx. 4 P.M., Mr. H. Kisch: Frontal Sinus Operations.

ROYAL DENTAL HOSPITAL POST-GRADUATE LECTURES.

Wednesday, April 24th.—6 P.M., Prof. J. C. Drummond: Certain Biochemical Aspects of Saliva.

EUGENICS SOCIETY, at Burlington House, Piccadilly.

Wednesday, April 24th.—5.15 P.M., Mr. C. J. Bond: Hæmolateral Asymmetry in Animals and Man, and its Relation to Cross-breeding.

CENTRAL ASSOCIATION FOR MENTAL WELFARE, at Central Hall, Westminster.

Thursday, April 25th, and Friday, the 26th, Conference on Mental Welfare.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

Tuesday, April 23rd.—4.15 P.M., Dr. A. H. Holmes: Minor Medical Operations.

Friday.—4.15 P.M., Mr. W. R. Douglas: Demonstration of Surgical Cases.

ANCOATS HOSPITAL POST-GRADUATE LECTURES, Mill-street.

Thursday, April 25th.—4.15 P.M., Mr. E. E. Hughes: Modern Urological Methods.

Appointments.

Lytle, W. J., F.R.C.S. Eng., has been appointed Assistant Surgeon to the Royal Infirmary, Sheffield.

Summers, R. D., L.R.C.P. Lond., M.R.C.S., District Medical Officer for the London County Council, District 12.

Certifying Surgeons under the Factory and Workshop Acts: Harper, C. G., L.R.C.P. Lond., M.R.C.S. (Market Deeping), and Harper, F. G., M.D., Ch.B. Edin. (Somercotes).

Vacancies.

For further information refer to the advertisement columns.

Bath, Royal United Hospital.—H.P. Also Asst. H.S. At rate of £120 and £100 respectively.

Bedford County Hospital.—Asst. H.S. At rate of £130.

Bedfordshire Sanatorium, near Bedford.—Res. Asst. M.O. £150.

Birmingham, Ear and Throat Hospital.—3rd H.S. At rate of £150.

Birmingham General Hospital.—H.P. £70.

Birmingham and Midland Eye Hospital, Church-street.—Surgical Registrar.

Burnley, Victoria Hospital.—H.S. At rate of £125.

Bradford Royal Infirmary.—H.P. and 2 H.S.'s. Each £150. Also Hon. P.

Brighton, Royal Sussex County Hospital.—Three Hon. Med. Clin. Assts. Also Hon. Clin. Asst. to Dental Department.

Bristol Education Committee.—Asst. School M.O. £600.

Bristol Royal Infirmary.—Hon. Med. Reg. Also Hon. Reg. to Ear, Nose and Throat Dept.

Bristol University—Chair of Physiology.

Bury St. Edmund's, West Suffolk General Hospital.—H.S. £150.

Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.

Cardiff Royal Infirmary.—Ophthalmic H.S. At rate of £75.

Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—Second Res. H.S. £75.

Derby, Bretby Hall Orthopædic Hospital, near Burton-on-Trent.—Res. Med. Supt. £750.

Derby, Derbyshire Education Committee.—Asst. School M.O. £600.

Derby Guardians' Institution and Infirmary.—Second Res. M.O. £250.

Edinburgh Royal Infirmary.—Secretary and Treasurer. £900.

Elizabeth Garrett Anderson Hospital, Euston-road.—Jun. Asst. Obstetrician. Also Asst. Radiologist. £100.

Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120. Also Hon. Phys. to Out-Patients.

Farringdon General Dispensary, Holborn-circus, E.C.—Physician.

Gravesend and North Kent Hospital.—Jun. H.S. £80–£200

Hackney Hospital, High-street, Homerton, E.—Jun. Asst. M.O. £350.

Halifax Royal Infirmary.—Third H.S. At rate of £100.

Harefield, Middlesex, County (Tuberculosis) Sanatorium.—Third Asst. Res. M.O. £400.

Hôpital Français, 172, Shaftesbury-avenue, W.C.—Jun. Res. M.O. £100.

Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.P. At rate of £100.

Hove Hospital, Sackville-road.—Res. M.O. £150.

Hull Royal Infirmary.—Hon. Physician.

Inverness, Northern Infirmary.—Pathologist and Bacteriologist. £700.

Kingston-upon-Hull City and County of.—Asst. M.O.H. £600.

Liverpool Port Sanitary Authority.—Asst. Port M.O. £700.

Liverpool, Royal Liverpool Babies' Hospital, Woolton.—Res. M.O. At rate of £90. Also Locum.

Liverpool, Stanley Hospital.—H.P. At rate of £100.

London Hospital, Whitechapel, E.—Gynæcological First Asst. and Obstetric Tutor. £300.

London Female Lock Hospital, Harrow-road, W.—Hon. Obstet. Surg.

London Temperance Hospital, Hampstead-road, N.W.—Surg. Reg. 40 guineas.

Manchester Royal Infirmary.—First Asst. in Clinical Laboratory £350. Also Dickinson Research Travelling Scholarship in Medicine. £300. Also Pathology Scholarship. £75.

Manchester Victoria Memorial Jewish Hospital.—Hon. Gyn. Surgeon.

Miller General Hospital, Greenwich-road, S.E.—Out-patient Officer. At rate of £150.

New End Hospital, Hampstead, N.W.—Jun. Res. Asst. M.O. At rate of £200.

Norwich City Mental Hospital.—Jun. Asst. M.O. £500.

Plumstead and District Hospital, Plumstead High-street, S.E.—Third Asst. M.O. £300.

Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Res. Anæsthetist. £80.

Queen's Hospital for Children, Hackney-road, E.—H.P. and Cas.O. Each at rate of £100. Also Surg. to Ear, Nose and Throat Dept.

Rhondda Urban District Council.—Asst. M.O.H., &c. £600.

Royal National Orthopædic Hospital, 234, Great Portland-street, W. Surgical Registrar. At rate of £105.

St. Albans, Hertfordshire County Mental Hospital.—Pathologist. £525.

St. Bartholomew's Medical College.—Senior Curator of Museum.

St. Helens County Borough.—Asst. M.O.H. £450.

St. Mary's Hospital, Institute of Pathology and Research, Paddington, W.—Research Studentship. At rate of £200.

Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. At rate of £100.

Sheffield, Nether Edge Hospital.—H.P. £150.

South Shields, Harton Poor-law Institution, &c.—Res. Asst. M.O. £300.

Sunderland, Royal Infirmary.—Hon. Physician.

Walsall General Hospital.—Jun. H.S. At rate of £100.

West Bromwich and District General Hospital.—Two Hon. Ophth. S.'s. Also Hon. Anæsthetists.

Wolverhampton and Midland Counties Eye Infirmary.—H.S. £200.

Wolverhampton, Royal Hospital.—Res. M.O. At rate of £150.

Woolwich and District War Memorial Hospital, Shooters' Hill, S.E.—H.S. At rate of £125.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Norwich (Norfolk); Kingsclere (Hants.); and at Rhayader (Radnorshire).

The Home Secretary gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act for the District of Barnsley County Court. Applications should reach the Private Secretary, Home Office, Whitehall, London, S.W. 1, not later than May 1st.

Births, Marriages, and Deaths.

BIRTHS.

Ballance.—On April 8th, at Westfield, Hatfield, the wife of Dr. Ballance, of a daughter.

Murray Bligh.—On April 12th, at 74, Rodney-street, Liverpool, to the wife of John Murray Bligh, M.D. Liverp., M.R.C.P. Lond.—a son.

Price.—On April 11th, at the Maternity Home, Driffield, to Dorothy Price, M.B., B.Ch. (*née* Tait), the wife of V. R. Price, of Hornsea, Yorks, of a daughter.

Pye.—On April 10th, at a nursing home in Winchester, the wife of Dr. E. A. Pye, *of a son.*

MARRIAGES.

Bush—Vizard.—On April 13th, at All Saints' Church, Hove, Dr. Frank Parkinson Bush, of Chester-place, Norwich, to "Betty" (Florence), only daughter of Mrs. W. Vizard, of Denmark Villas, *Hove.*

Smellie—Lamsdale.—On April 10th, 1929, at Sutton Coldfield Parish Church, James Maclure Smellie, M.D., M.R.C.P., to Kathleen, only daughter of Mr. and Mrs. H. Lamsdale, of Four Oaks, Sutton Coldfield.

DEATHS.

Addinsell.—On April 8th, at The Old Prebendal House, Shipton-under-Wychwood, Oxon., Lieut.-Colonel Augustus Whitehorn Addinsell, M.R.C.P., aged 71 years.

Kirkwood.—On April 13th, at Tymawr, Ravenslea-road, S.W., Thomas Kirkwood, M.A., M.B., C.M., D.P.H., in his 62nd year.

Rutherfurd.—On April 14th, at Bute-gardens, Glasgow, W., Henry Rutherfurd, M.A., M.B., C.M., F.R.F.P.S. Glasg.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE LANCET: SUBSCRIPTION RATES.

INLAND	One Year	£2	2	0
	Six Months	1	1	0
	Three Months	0	10	6
ABROAD	One Year	2	10	0
	Six Months	1	5	0
	Three Months	0	12	6

Notes, Comments, and Abstracts.

RELIEF OF LOCAL RATES UNDER THE LOCAL GOVERNMENT ACT.

NINE Conservative Members of Parliament, who have made a special study of the ground covered by the new Local Government Act, have combined to expound its various aspects in a readable little book.[1] Mr. R. S. Hudson's chapter on "Poor Law" is a particularly good summary of the English system of poor relief from Elizabethan times. He cites effectively the list of inmates to be found in one poor-law institution last November—7 acutely sick persons, 9 uncertified mental deficients, 55 infirm and senile, 6 epileptics, 18 certified mental deficients, one able-bodied man, 8 certified lunatics, and 3 healthy infants. Mr. D. W. Gunston, in a chapter on "Rural Areas," makes the same point, and asks whether anyone would be anxious to enter such a place. London is specially dealt with by Sir Cyril Cobb, who describes the negotiations which preceded the agreement upon Mr. Chamberlain's final clauses. Mr. T. J. O'Connor attacks the rival policies of the Labour and Liberal parties, and Mr. Geoffrey Peto sums up at the finish. Though this little volume on "Rating Relief" is mainly concerned with the English legislation, room has fortunately been found for an excellent chapter on Scotland by Mr. C. M. Barclay-Harvey, which not only shows the differences between the two national systems of local government, but also prepares us for the corresponding Scottish Act which Parliament is expected to pass into law during the next few weeks. Both in England and Scotland the changes are so vast that any help towards understanding their general principles is welcome. "Rating Relief" is a sincere and competent contribution.

Sir Kingsley Wood has all the arguments at his fingers' ends, and has marshalled them lucidly and persuasively. His book[2] covers the whole plan of the Local Government Act in some 60 readable pages with an appendix of the figures (already published elsewhere), showing how the Act may be expected to affect the rates in areas in England and Wales. Within the brief limits set for it, "Relief for the Ratepayer" is the best book of its kind, valuable not only to the political advocate on the platform, but also to the army of voluntary administrators whose unselfish devotion to the public service will, as the Minister of Health says, now find new and wider scope for its activity.

A FATAL DRAUGHT OF MEDICINE.

A MAN, aged 39, living at Mayfield, in Sussex, developed a severe cold and sore-throat, and on April 2nd received a prescription from his medical adviser, Dr. G. A. Shackel, and had it made up by the local chemist. He took two or three doses, and about 1 P.M. on April 3rd he swallowed a whole dose in one mouthful, and died in a few minutes. The inquest was opened on April 5th, but the coroner, Dr. E. F. Hoare, adjourned the inquiry in order that the remaining contents of the bottle of medicine might be analysed. On April 9th he announced that the public analyst for East Sussex had written to say that there was nothing poisonous in the medicine which would have caused the patient's death. A nurse who had been called in to attend the patient said she did not know at that time that he had had a drink, or that he was choking. The symptoms, she said, resembled very much those of an epileptic fit, but she knew that he was not in a fit. The convulsions gradually became less, and she applied a mustard leaf without avail. The man did not speak, and died in a few moments. The chemist's assistant who made up the prescription said it was for a diaphoretic mixture containing nothing poisonous. The doses were of the usual strength and the bottle was properly labelled. The directions were further mentioned to the messenger who took the bottle away. Dr. Shackel said that in his opinion death was due to asphyxia caused by the man having choked himself. The heart was in a very weak state and that might have contributed to his sudden death. The man had no doubt choked himself by swallowing a dose of medicine too quickly so that it passed into the windpipe. The coroner said he would return a verdict in accordance with the medical evidence. The case, he added, was rather instructive; the whole point was that the man swallowed the medicine very quickly, and this kind of thing might happen to anyone at any time. He complimented the nurse on her conduct, remarking that no blame attached to anyone.

MEDIÆVAL WILLS.

To the Editor of THE LANCET.

SIR,—In the article on the above subject in THE LANCET for April 6th mention is made of the will of a barber-surgeon of Newcastle dated 1585. In the Surtees Society's publication, *Testamenta Eboracensia*, Vol. I., is the transcription of the will of a barber-surgeon of much earlier date—i.e., Oct. 20th, 1392. This is of considerable interest from the fact that it gives much information as to the furniture and belongings of a barber in the fourteenth century. Therein William de Dalton, who had received his freedom of the City of York as a barber in 1350, directs his body to be buried in the Priory Church of the Holy Trinity, Mykylgat (Micklegate) and bequeaths to the high altar certain linen, wax for candles, and "unam cistam ferro ligatam pro custodiendis ornamentis." Amongst other bequests he bequeaths to his executor Thomas de Garton the instruments of his occupation—viz., j pelvem rotundam parvam, j pecten de ebore, j brusche, j speculum, j cathedram cum sege, unum cochlear novum quod habet in suâ possessione, j razur habens manubrium de ebore."

To his servant Agnes Cuk, he leaves his matrass, and bolster with the bedlinen, his pestle and mortar and the wooden board which was presumably used for spreading ointments, together with the cooking utensils.

From the list of individual bequests it is clear that the testator was very comfortably off and that in his long life he had prospered. He died shortly after making his will, which was proved on March 24th, 1393.

It may be added that in the Church of Holy Trinity, Micklegate, is a mural tablet to Dr. John Burton, the man-midwife, who was the prototype of "Dr. Slop" in Lawrence Sterne's *Tristram Shandy.* A pair of midwifery forceps which belonged to him, and may have been that responsible for the shape of Tristram's nose, is still preserved in the York Medical Library.

I am, Sir, yours faithfully,

Birmingham, April 10th, 1929. G. A. AUDEN.

A FOOLISH MYSTIFICATION.

To the Editor of THE LANCET.

SIR,—The fact, alluded to in a note published recently in THE LANCET, that occasionally an old book gained in value from autograph notes presumably made by a previous owner, was well known to a person in the days when Holywell-street was lined on the south side with books of every description for sale at every price. For a short period a good many book-hunters picked up in Holywell-street for small sums books that were annotated, often with amusing erudition, the entries being made in pencil, and the references occurring in them being now and again to historic circumstances, or to known passages in the lives of public men; several learned bibliophiles, from the internal evidence, were led to believe that they had picked up books which had belonged to the famous dead and, I believe, printed their deductions. It turned out afterwards that the marginal notes were the ingenious labour of a practical joker. He made no profit, as he did not forge the name of any suggested former owner on the title page; thus no Holywell-street shopkeeper was deceived into giving him a high price for an otherwise worthless book—that would have been a difficult accomplishment. Hence the books remained cheap and apparently a prize for such bargain-hunters as made industrious investigations before parting with their pence. The trickster was simply enjoying himself by mystifying book collectors, which he was able to do until the frequency of these curious finds in the book-boxes of Holywell-street led to suspicion and revelation of the trick.

I was told this story, apropos the purchase in a book-box of some work alleged to be annotated by a historic doctor, and my informant professed to know who the silly ass was who was trying to mystify his brother collectors.

Of course, some of these books may have since received value from an acceptance of the forgeries.

I am, Sir, yours faithfully,

April 12th, 1929. M.D.

NEW PREPARATIONS.

Albichthon Ointment.—We have received from the Ichthyol Co., Ltd., 18, Adam-street, Adelphi, London, W.C., a sample of a new preparation of colourless sulphur having the same characteristics as other ichthyol preparations in accordance with its chemical composition, and pharmacological tests justify this view. It contains a little over 12 per cent. of sulphur and is supplied in collapsible tubes of three strengths. Ichthyol, prepared from schist oil obtained from the bituminous shale workings of Seefeld in the Tyrol, has only a slightly lower sulphur content than that of Albichthon, which therefore might be expected to be efficacious in chronic skin diseases such as eczema, psoriasis, and acne, where ichthyol is of a well-tried value that does not require to be insisted upon. The remedy is made up in a convenient way for use.

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[1] Rating Relief. The Great Reform Act lucidly explained by a group of Conservative M.P.'s, with introduction by the Prime Minister. London: Philip Allan & Co., 1929. Pp. 183. 3s. *6d.*

[2] Relief for the Ratepayer. A popular explanation of the Local Government Bill, 1929, by Sir Kingsley Wood, with an introduction by Mr. Neville Chamberlain and a Foreword by the Prime Minister. London: Ernest Benn, Ltd., 1929. 136 pp. 1s. *6d.*

An Address

ON

ACUTE INTESTINAL OBSTRUCTION.

Delivered before the Medical Society of London on Feb. 25th[*]

By A. H. BURGESS, M.B., M.Sc. Manch., F.R.C.S. Eng.,

SURGEON TO THE MANCHESTER ROYAL INFIRMARY; PROFESSOR OF SURGERY IN THE UNIVERSITY OF MANCHESTER; AND PRESIDENT-ELECT OF THE BRITISH MEDICAL ASSOCIATION.

The acute abdominal crises have always especially interested me, and I am rather concerned to find that it appears to be the custom in London to describe these under the designation "the acute abdomen." I hate that term, and I never hear it without experiencing an almost irresistible desire to immediately confer upon its user an "acute traumatic buttock"—the two terms are about on a parity of inelegance.

Its High Mortality.

The present century has witnessed great improvements in the results of the surgical treatment of abdominal crises, but this improvement has not been obtained equally in the various groups. At the Manchester Royal Infirmary our mortality for acute appendicitis in 1924 was one-twelfth and that for gastro-duodenal perforations one-seventh of that of 1900, whereas that for acute intestinal obstruction was still one-half that of 1900. The best recent series of statistics on acute intestinal obstruction is that which was compiled by Mr. H. S. Souttar for the Bath meeting of the British Medical Association in 1925. He collected the statistics of the five years, 1920–24 inclusive, of seven large hospitals (three in London—Guy's, St. Thomas's, St. Bartholomew's; three in the provinces—Newcastle, Manchester, and Bristol; and the Belfast Royal Infirmary (see table). I hope Mr. Souttar will compile a further series from the same hospitals for the five-year period, 1925–29 inclusive, and present a comparison of the results at Winnipeg in 1930. In adopting Mr. Souttar's figures I wish to modify them by excluding all cases of strangulated hernia and of idiopathic intussusception, my reason being that I wish to-night to consider only those cases of acute intestinal obstruction the diagnosis of which is not readily obvious. There is, nowadays, no excuse for overlooking obstruction from strangulated hernia or intussusception; moreover, the latter is not primarily an obstruction, and, indeed, as pointed out by MacLennan, of Glasgow, the object of early diagnosis and treatment is to prevent an intussusception becoming an obstruction, just as we wish to prevent an acute appendicitis from becoming a peritonitis. Excluding hernia and intussusception, therefore, we are left with 1042 cases with 395 deaths, a mortality of 37·9 per cent.; this is the real mortality of acute intestinal obstruction the cause of which is not readily obvious, and it is this high mortality which we are out to reduce. In Manchester, I am pleased to say, this mortality is tending to diminish; thus at the Royal Infirmary our mortality for the ten-year period 1913 to 1922 was 41·07 per cent., for 1920–24 (the period covered by Mr. Souttar's table) 33·5 per cent., and for 1925 to 1927 (the last year for which we have the reports fully analysed) only 30·2 per cent.

What is the reason for this high mortality? The main reason is delay in the application of surgical treatment. The early diagnosis of acute intestinal obstruction has not kept pace with the improvements in the diagnosis of the other groups of abdominal crises; too many cases still present themselves with distended abdomens and advanced toxæmia. The early signs are not sufficiently insisted upon in the surgical text-books, except the most recent ones, in which, I am pleased to say, there is a decided improvement. Far too much emphasis is usually laid upon fæcal vomiting as a sign of acute obstruction; it should not be regarded as a sign but rather as an end-result. Such emphasis rather encourages the waverer to await fæcal vomiting to complete the clinical picture. The only hand, however, that ever paints a complete pathological and clinical picture of any morbid state is the hand of Death. The man who waits for fæcal vomiting will practically never make a mistake in diagnosis, but rarely, if ever, will he save his patient. Far better for the community in general would it have been had the original advent into this world of such a would-be infallible diagnostician been in itself a perfectly complete clinical picture of the process of stillbirth.

Diagnosis.

Acute intestinal obstruction may be either primary, coming like a "bolt from the blue," or secondary, being engrafted upon the subacute or chronic obstruction. In distinguishing between primary and secondary obstruction there are two important clinical guides. In secondary obstruction we can frequently see (1) the outlines of individual dilated coils, and (2) visible peristalsis passing along them. Sudden acute obstruction always leads to dilatation with thinning of the wall, and is not associated with visible peristalsis. Where the abdominal wall is extremely thin—as in the emaciation following typhoid fever, or in the thinned-out coverings of a ventral hernia, or a divarication of the recti muscle—it may be possible to see visible peristalsis in the absence of any obstruction; but this visible peristalsis is in normal-sized coils and is no exception to the rule that whenever the outlines of individual *dilated* coils can be seen, together with a peristaltic wave passing along them, it is quite safe to diagnose intestinal obstruction of at least several weeks' duration. Even when peristalsis is not visible it may be "palpable"; by keeping the hand flat upon the abdomen the underlying coil may be felt to alternately harden and soften, much like the pregnant uterus.

Primary acute intestinal obstruction varies considerably in its acuteness of onset, being especially acute in internal strangulation, volvulus, and acute intussusception—all conditions in which there is not only an obstruction to the onward passage of the fæcal stream, but also, of much greater importance, to the circulation of the bowel concerned. Fæces may be arrested for days or even weeks but no patient can long survive a complete arrest of the circulation of the bowel. The acuteness of onset depends upon (*a*) the degree of associated strangulation, and (*b*) the site of the obstruction. In general terms the higher the obstruction the more acute the onset, although an exception to this will be recalled in the case of volvulus of the sigmoid colon, the onset of which is extremely acute, probably from the large amount of mesentery involved. The early symptoms of acute primary intestinal obstruction are common to those of any other acute abdominal crisis; they are the symptoms which, years ago, were described by Sir Frederick Treves as "peritonism." They are of reflex origin and have no localising value whatever. In acute intestinal obstruction the pain is always referred to the epigastric region, and I have never known it have any localising value. Often paroxysmal at first, it becomes continuous as the obstruction becomes complete. The vomiting, like the pain, is at first reflex and depends upon the acuteness of onset much more than upon the site of obstruction; later vomiting is due to the mechanical obstruction and appears earlier the higher its site, being most marked in acute dilatation of the stomach (from compression of the third portion of the duodenum) and in gall-stone impaction in the upper jejunum; in low obstruction, as from carcinoma of the rectum, vomiting may be absent throughout. At first the vomit consists of gastric contents, later it becomes bilious, and later still, brown and fæculent in odour, constituting the so-called stercoraceous or fæcal vomit. True fæcal vomit—i.e., the vomiting of actual fæces—never occurs in intestinal obstruction but only in cases of gastro-colic fistulæ (although cases have been recorded as having occurred in functional nervous disease). The persistence of the vomiting is its chief characteristic. The cessation of the passage of fæces and flatus may not be absolute at first, and one, or even two, enemata may bring away fæces present in the bowel below the site of the obstruction. Such does not, however, give any relief to the symptoms.

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[*] This meeting was reported in The Lancet, March 2nd, p. 441.

Distension of the coil above the site of obstruction must, of course, be present in every case, but it is not always visible. If the case be seen early the distension may be localised, and may prove a valuable guide to the site of obstruction; soon, however, the distension gets uniform and separate coils cannot be distinguished. The degree of distension varies inversely with the vomiting—in high obstruction vomiting is marked with very little distension, in low obstruction the converse obtains. The central distension of small intestine obstruction contrasts with the barrel-shaped abdomen (from distension of the flanks) of sigmoid obstruction. In volvulus of the sigmoid distension comes on extremely rapidly and is intensely marked, the abdomen appearing as if it were about to burst; this distension, be it noted, is in the twisted loop itself and not in the bowel above the volvulus. Steadily progressive abdominal distension is one of the most important signs of intestinal obstruction. Abdominal palpation may sometimes reveal the presence of a tumour in acute intussusception and in malignant disease, and I have twice felt large gall-stones, and in a third case what I took to be a gall-stone, but which proved to be a large hair-ball from the stomach. Auscultation is a much neglected method of investigation, and one to which I attach much value. After a little experience one gets to recognise certain sounds associated with distended intestines, and the contrast between the turbulent gurgling sounds of mechanical obstruction and the deathlike silence of paralytic ileus is very marked.

TABLE ILLUSTRATING MR. H. S. SOUTTAR'S REPORT ON ACUTE INTESTINAL OBSTRUCTION. COMBINED STATISTICS FROM SEVEN HOSPITALS.

Cause.	Age decade.								Site.				Duration in days.					Operation.					Result.		Totals.	Mortality (per cent.).
	1	2	3	4	5	6	7	8	Small intestine.	Right colon.	Left colon.	Rectum.	½	1	2	4	+	Reduction.	Enterotomy.	Enterostomy.	Anastomosis.	Resection.	Lived.	Died.		
Gall-stones	—	—	—	—	1	7	15	5	26	—	2	—	—	—	3	10	12	—	25	3	—	—	14	14	28	50
Carcinoma	—	2	7	31	52	114	110	41	2	46	246	54	1	12	51	46	121	—	—	313	48	37	202	156	358	43·5
Adhesions	20	72	65	52	49	29	27	15	308	23	10	2	9	67	88	61	59	283	—	—	36	20	235	10	342	31
Internal strangulation ..	17	42	34	31	25	27	25	11	211	6	6	—	13	38	50	28	17	134	—	27	32	33	149	74	223	33
Intussusception (idiopathic)	577	14	7	9	5	2	—	—	526	100	14	—	130	173	91	37	24	544	2	13	48	58	476	137	613	22
Intussusception with tumour	8	3	—	1	2	2	1	—	15	—	2	—	—	2	3	1	4	13	4	2	2	9	11	6	17	35
Volvulus	2	6	11	10	12	18	11	4	39	18	20	—	3	10	12	11	9	47	3	17	12	18	36	38	74	51
Total (excluding hernias)																							1123	532	1655	32·1
Inguinal hernia	31	33	37	54	82	17	104	65	457	31	13	Om. 29	70	101	74	44	41	501	2	11	27	34	451	83	634	16
Femoral hernia	2	3	27	83	157	148	175	97	537	5	4	29	128	127	99	66	82	618	1	14	55	57	557	118	675	20
Umbilical hernia ..	—	—	5	4	28	76	68	19	159	36		12	8	23	30	29	35	170	1	14	27	33	129	71	200	35
Total hernias ..																							1137	272	1409	19·3
Grand total ..																							2260	804	3064	26·2

Om = Omental.

	Cases.	Deaths.	Mortality (per cent.)
Mortality (excluding hernia and idiopathic intussusception) ..	1042	395	37·9
Mortality of hernia and intussusception combined ..	2022	409	20·22

Rectal examination is of the greatest importance. In some cases the cause of the obstruction itself can be detected, as in stricture or growth of the rectum, or an intussusception may be felt. Sometimes through the anterior wall of the rectum a growth of the sigmoid can be discovered, or the presence of dilated coils of small intestines in the pelvis definitely ascertained. Sometimes "ballooning" of the rectum, so suggestive of sigmoid obstruction, can be felt. Wherever there is any reason to suspect the colon as the site of the obstruction a sigmoidoscopic examination ought to be made. The sigmoidoscope can be passed from 8 to 11 inches, and from a negative point of view it is often valuable to be able to say that there is no obstruction within that distance.

THE SITE AND NATURE OF OBSTRUCTION.

In the absence of any guide, such as a tumour palpable through the abdominal wall, or per rectum, or the presence of a local distension only, the most important step is to distinguish between small and large bowel obstruction. As regards relative frequency Souttar's list (excluding hernia and intussusception) indicate 586 cases of small (57·6 per cent.) to 433 of large (42·4 per cent.) intestine obstruction—that is, the chances are slightly more in favour of small than of large bowel obstruction. The Manchester Royal Infirmary figures show a preponderance of the large bowel, but taking all cases together we may assume that obstruction (excluding hernia and intussusception) is fairly equally divided between the small and the large bowel. A previous medical history of intestinal troubles before the onset of acute obstruction is much more in favour of the large intestine being concerned, since 91 per cent. of obstructions in the colon are due to carcinoma, and this usually produces some previous disturbances, such as colicky pains after meals, often travelling up to and becoming arrested at the same spot, frequently associated with borborygmi, sometimes audible to others, attacks of diarrhœa alternating with constipation, slight attacks of flatulent distension which pass off, and large quantities of mucus in the stools, sometimes even blood-stained. The keynote of the position, however, is the condition of the cæcum—

if this can be seen to be distended or the site of visible peristalsis or, failing this, if palpable peristalsis can be discovered on careful palpation then the obstruction must be in the colon distal to the cæcum.

If the obstruction can be located to the large intestine there is a 91 per cent. chance of its being of a malignant nature—that is, roughly a 9 to 1 chance. On the other hand, if the large intestine can be excluded as the site of the obstruction, then the odds are nearly 300 to 1 against malignancy (out of 586 cases of small intestinal obstruction only two were due to malignant growth); 88 per cent. of small intestine obstructions are due to adhesions or internal strangulations.

TREATMENT.

I refer here only to the treatment of mechanical obstruction, leaving the very interesting subject of post-operative paralytic ileus for consideration by those who follow me. Operative treatment is essential for mechanical obstruction. Accessory forms of treatment may be very useful in conjunction with operation especially—(1) gastric lavage; (2) the introduction of large amounts of hypertonic saline solution subcutaneously or intravenously so as to replace the great loss of fluids and of chlorides from the blood; (3) the administration of antigas-gangrene serum (B. W. Williams); and (4) enemata of bile, as advocated by R. St. L. Brockman, of Sheffield.

The nature of the operation will depend upon the stage of the disease. In *early* cases, with little distension and good general condition, an exploratory laparotomy is undertaken on the usual lines, the only points I would specially stress being the importance of preliminary gastric lavage and the use of spinal anæsthesia (especially Dr. George P. Pitkin's method of controllable spinal anæsthesia). Having discovered the cause of the obstruction, removal, short circuit or artificial anus proximal to the obstruction should be carried out in this order of preference. It is with the *late* cases, with general abdominal distension and poor general condition, that difficulties arise in deciding what is best to be done. With care I think it is possible in most cases to know whether the obstruction is in the large or the small intestine. If it can be located to the colon I feel strongly that one should content oneself for the time being with a blind cæcostomy, carried out under local anæsthesia or under nitrous oxide gas, through a gridiron incision in the right iliac fossa. This will relieve the obstruction. I am well aware that this measure gives one no information as to the exact site or nature of the obstruction, as to the presence of any secondary deposits in the glands, peritoneum or liver, or whether it is capable of removal at some future date, or, failing this, whether short-circuiting is possible. All this information is, of course, essential before the case is finally disposed of; none of it, however, need necessarily be known at the time of the cæcostomy, and it is far better to tide the patient over the immediate necessity (that is, the relief of the obstruction) and not to attempt to acquire this information for the moment. All of it can be much more safely obtained when the obstruction has been removed by cæcostomy. The only serious objection to blind cæcostomy is the risk that the obstruction in the colon may be some form of internal strangulation, so that although the cæcostomy relieves the obstruction the strangulation, not being relieved, would result in perforation and peritonitis. The Manchester Royal Infirmary statistics show that the risk of such strangulation in the colon being overlooked at a blind cæcostomy is at the most 1·5 per cent., and I think even the most optimistic advocate of preliminary exploratory laparotomy must admit that it would add more than 1·5 per cent. to the mortality of blind cæcostomy.

If, however, one cannot, before operation, locate the obstruction to the colon then a right paramedian exploratory laparotomy must be performed, and the condition of the cæcum definitely ascertained. If distended I would, without any further exploration, advocate immediate blind cæcostomy, either through the original wound, if the cæcum will come readily up into it, or, as in most cases, after rapidly closing up the laparotomy wound, I would perform a blind gridiron cæcostomy. If the cæcum is found collapsed then the hernial orifices are rapidly examined from within, a collapsed coil of ileum is picked up from the right-hand side of the bottom of the pelvis, and is traced upwards to the site of the obstruction. It may be inquired, since I advocate blind cæcostomy as the method of choice for these late cases of obstruction of the colon, why do I not advocate blind enterostomy for obstruction in the small intestine. The difference is one of the relative frequency of the presence of strangulation. As I have shown, in the case of the large intestine after relief of the obstruction by cæcostomy, the risk of an unrelieved strangulation remaining undiscovered is at most 1·5 per cent. An analysis of Souttar's statistics shows that in the case of the small intestine, even after relief of the obstruction by an enterostomy, the risk of unrelieved strangulation remaining would be at least 42·6 per cent.

ENDOCARDITIS LENTA.*

BY GLADYS M. WAUCHOPE M.D.,
M.R.C.P. LOND.,
ASSISTANT PHYSICIAN TO THE NEW SUSSEX HOSPITAL FOR WOMEN AND CHILDREN.

THE name "endocarditis lenta" has never really become popular, though it well describes the more chronic forms of infective endocarditis. It was first used by Schottmüller in 1910 and applied to five cases of subacute infective endocarditis due to the *Streptococcus viridans* seu *mitior* (named from the green colour of the culture on blood-agar and its feeble hæmolytic powers), an organism which he had isolated in 1903. Later writers used the term to describe cases of subacute or chronic endocarditis due to any organism except that of rheumatism, and it is so used in the present paper.

Osler, in the Goulstonian lectures for 1885, drew attention to the more chronic forms of infective endocarditis, while Jaccoud recognised the condition at about the same time (1883), and later French writers refer to "le type Jaccoud-Osler" (Flessinger et Janet 1920). In 1908 Osler and Horder described very fully the clinical aspects, but the disease was somewhat rare until the war of 1914–18 when many cases were seen in soldiers, especially those who served on the Western front (Curschmann, 1922, Wauchope, 1925).

The present paper is based on 200 cases taken from the London Hospital records. Of these 131 were verified by autopsy; in the remainder a time basis has been employed to divide them from cases of acute infective endocarditis, no case being included in which definite symptoms of the illness were present for less than three months.

Ætiology.

The ætiology is obscure, but various predisposing factors are recognised.

TABLE I.—*Congenital Malformations of the Heart.*

Complete transposition of the heart and other viscera ..	1
Patent septum membranaceum..	1
Four cusps to pulmonary valve (infective endocarditis of mitral valve only)	1
Bicuspid aortic valve (one case associated with coarctation of the aorta)	5

1. *Previous Heart Disease.*—(*a*) Congenital lesions. It is well known that infective endocarditis often supervenes on gross congenital malformations; recently attention has been drawn to the influence of the bicuspid aortic valve in predisposing to endocarditis lenta (Lewis, 1923, Horder, 1926, Wauchope,

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* A paper read before the Brighton and Sussex Medico-Chirurgical Society.

1928). The congenital lesions found in the London Hospital cases are shown in Table I.

(*b*) Acquired valvular disease. Syphilitic aortic endocarditis was present in only one of these cases, and is not considered a predisposing factor. Rheumatism is, however, of great importance, and the earlier writers, especially, e.g., Osler (1908), Horder (1908), and Schottmüller (1910), lay stress on the observation that more than half the cases had previous rheumatic cardiac lesions. Blümer in 1923 collected 330 cases from the literature and found a history of rheumatism in 140, of chorea in 10, and of tonsillitis in 18, the three together making over 50 per cent. In ex-Service men the proportion with previous rheumatism was less. Cotton, for instance, found a history of rheumatism in 29 per cent. of warpensioners. Morawitz (Würzburg) found it in 3 out of 17 ex-soldiers and Starling found rheumatic scarring in 1 only out of 13 autopsies. Histories are notoriously unreliable and everyone has seen cases of young people who had definite signs of mitral stenosis and yet denied having had any illness compatible with a diagnosis of acute rheumatism. On the other hand, post-mortem evidence is not conclusive because the extreme fibrosis and destruction of valves found in long-standing cases of endocarditis lenta may obscure the evidence of a previous rheumatic lesion. It is probably for this reason that most observers rely on the history, and although a negative history is worthless an analysis of the London Hospital patients who stated that they had had rheumatism, set out in Table II., may be of interest.

TABLE II.—*History of Rheumatic Fever or Chorea.*

—	Cases of endocarditis lenta.	Cases with history of rheumatism.	Percentage with history of rheumatism.
Civilian males ..	93	49	52·6
Ex-soldiers ..	40	9	22·5
Females	67	38	56·7
Total	200	96	48·0

In 17 males (none of them soldiers) and 11 females the heart was known to have been affected by a previous attack of rheumatism, while 8 males and 3 females said they had had "heart trouble" but no rheumatism. This gives percentages of 18·8 in all males and 20·9 in females who were known to have had a cardiac lesion before the onset of endocarditis lenta.

2. *Factors Connected with Army Service.*—Since previous heart disease was not an important predisposing factor in soldiers other causes have been suggested; wounds and infections (Cotton, 1920), lowered resistance due to fatigue (Coombs, 1923) or the strain of carrying a heavy pack (Murray and Lougheed, 1921). All observers agree that the disease occurred in strong healthy men of about 35 years of age who had withstood long service, generally in France.

Of the 40 London Hospital patients who had been in the army 30 at least served in France and the histories of the majority point to long and strenuous service; 15 had been wounded and 11 gave a history of some febrile condition such as trench fever, influenza, septic poisoning.

3. In women *childbirth* may be the starting-point of the disease. Four of the patients in this series were confined 18, 13, 10, and 7 months before death; in one the labour was said to have been difficult. A fifth miscarried four months before death, but this was probably the result of the illness, although the symptoms dated from the miscarriage.

4. In two patients *wholesale extraction of septic teeth* seemed to give rise to the infection, and I have seen another case since in which this sequence appeared clear.

The Infecting Organism.

This, in the majority of cases, is a short-chained non-hæmolytic streptococcus, the *Streptococcus viridans.* Libman (1923) states that 95 per cent. of cases are due to this organism, the remainder being nearly all due to Pfeiffer's bacillus. Blümer (1923) gives the following results from an analysis of the literature of 304 cases of infective endocarditis lasting for more than three months:—

Streptococcus	248*	Staphylococcus	8
Pneumococcus	16	Gonococcus	1
Bacillus influenzæ ..	16	Other organisms ..	15†

* Of which 169 were *S. viridans.* † Including 7 unclassified.

In 110 of the London Hospital cases an organism was identified before or after death, of which 73·6 per cent. certainly, 84·5 per cent. probably, were streptococcal (Table III.).

TABLE III.

Organisms identified.	Cases.	Organisms identified.	Cases.
Streptococcus	81	Unspecified Gram-positive cocci in culture ..	3
Staphylococcus	6	Gram-positive cocci in films	9
Pneumococcus	4		
Gonococcus	2		
Micrococcus catarrhalis ..	2		
Bacillus influenzæ ..	3	Total	110

Prof. H. M. Turnbull has pointed out to me that the above table cannot be accepted as giving the organisms responsible for the endocarditis lenta in individual cases. The organisms cultivated before or after death are not necessarily the cause of the endocarditis lenta. Microscopic sections are essential in determining the organism responsible for this peculiar kind of endocarditis. When only one kind of organism has been found within the valves in microscopic sections it has been found in almost all cases to be an extensively degenerated, Gram-positive streptococcus, presumably *S. viridans,* grouped in large masses; but in a few cases Pfeiffer's *B. influenzæ* or the gonococcus has alone been found. The cases in which the gonococcus or *B. influenzæ* was alone found were clinically in the length of their course less sharply differentiated from examples of acute infective endocarditis than were the other examples of endocarditis lenta. When organisms such as pneumococci and staphylococci had been cultivated, the sections of the valves showed the characteristic large masses of degenerated streptococci in addition to the pneumococci or staphylococci. That these latter organisms were not the cause of the endocarditis but a secondary infection was shown by their relative sparsity, by their limitation to the surface of the vegetations, or their presence within new vessels formed during the chronic inflammation of the valve, and by their being surrounded by a purulent reaction, which is not found in pure endocarditis lenta. Similar findings and conclusions were arrived at independently and have been published by Wright in an important paper (1925).

Secondary pneumococcal infection is frequently the result of a terminal pneumonia. This was true of two of the four cases in the above table, the pneumonia in one case being complicated by pneumococcal bacteriæmia and meningitis. In other respects the pneumococcal cases were similar to the cases of streptococcal endocarditis lenta.

The six staphylococcal cases also differed in no way in their clinical course from the cases of streptococcal infection, and this confirms the conclusions drawn from post-mortem appearances that these organisms are a terminal infection supervening on a streptococcal endocarditis. All the patients were men. One case was observed for eight months, another for over five, and another was a typical chronic case in a soldier lasting for a year. Staphylococci in pure culture were grown from the blood during life in all six cases; in one the culture had been sterile four days previously.

The two cases due to the gonococcus followed the usual course of gonococcal endocarditis and were both clinically and pathologically more subacute than chronic. Both occurred in women.

The first case, an unmarried girl of 20, was admitted to hospital early in November, 1922, with a tubo-ovarian abscess and pyosalpinx (found at laparotomy) and was observed till her death three and a half months later. The temperature never settled after the operation though the wound healed satisfactorily; a mitral murmur appeared in December and the blood culture grew gonococci in January, a month before death. The diagnosis was verified at autopsy, the mitral valve only being affected.

In the second case, a married women of 40, the illness ran a more chronic course and lasted for five months. There was no history of the original infection, but her husband had had gonorrhœa three years before, and though treated suffered from gleet. The illness began with symptoms of heart failure, and for the last six weeks of life the temperature was irregular and remittent, rising to a maximum of 103° F. Gonococci were cultured from the blood a week before death. The aortic, mitral, and tricuspid valves were covered with typical vegetations and the other post-mortem findings were those of endocarditis lenta.

Two of the three cases due to *B. influenzæ* were of six months' duration and in both the blood culture was sterile during life, but the organism was isolated after death. One of these patients died from cerebral embolism. The course of the third influenzal case was less chronic, three months in duration, with a remittent temperature reaching 103° F. The organism was twice cultured from the blood during life. Both the *M. catarrhalis* cases were febrile, one associated with rigors; in both emboli occurred and in both the blood culture was positive.

The more chronic the course of the illness the more often is the blood culture sterile. Libman (1925) distinguishes a bacteria-free stage in which the blood cultures are sterile and the vegetations at autopsy show few or no bacteria. Wright (1925) has shown that growth in blood cultures occurs even if the organisms are present in very small numbers, though in cases of streptococcal endocarditis it is often delayed. He pointed out that bacteriæmia is secondary and is due to the escape of organisms from the valves and that in the non-bacteriæmic cases the organisms are either dead or are prevented from reaching the blood stream by thrombus material. This non-bacteriæmic stage corresponds to the chronic type of the disease found in soldiers (Wauchope 1925). Among the 26 cases in soldiers in this series, where a culture was made, in four only (15·4 per cent.) was it positive, while in the 114 civilian cases examined it was positive in 68·4 per cent. In six only of the sterile civilian cases an organism was identified from the vegetations on the valves, but in seven of the soldiers.

Incidence.

The *sex-incidence* was altered by the war cases. Earlier writers note that the sexes were almost equally affected—e.g., Osler and Horder in 1908. Schottmüller in 1910 records 3 males to 2 females. Blümer in 1923 in the literature found 107 males to 131 females, a proportion of 3 to 2. The war brought a preponderance of males, especially in the chronic cases. In this series there were 133 males and 67 females, about 2 to 1, while in cases of over six months' duration the proportion was 3·4 to 1.

TABLE IV.—*Age-incidence of the London Hospital Patients.*

Age ..	10 to 19.	20 to 29.	30 to 39.	40 to 49.	Over 50.
Males	15	54	31	23	9
Females ..	10	32	14	10	2
Total	25	86	45	33	11
Percentage ..	12·5	43	22·5	16·5	5·5
Soldiers ..	—	16	15	8	1

Age-incidence.—The greatest number of cases occur in the decade between 20 and 30, the next in that between 30 and 40 (cf. Horder, 1908, Blümer, 1923). Of the London Hospital cases 65·8 per cent. occurred in patients between 20 and 40 (see Table IV.). In Osler's cases the men were older than the women, and this was the case at the London Hospital, where of the men 47 per cent. were over 30 while of the women 38·8 per cent. were over 30. The disease seems to be more chronic in older patients, and it is significant that in soldiers in whom the chronic type was seen so often, 60 per cent. were over 30. Becher (1921), Cotton (1920), and Curschmann (1920) record similar experience.

Initial Symptoms.

The onset is usually insidious and gradual, but in a few cases the patient is apparently well until, with dramatic suddenness, an embolus occurs. This happened to 11 of the patients in this series. Examples: A man of 41 had a left hemiplegia while serving with the army in France, another while playing billiards. A third, aged 25, was found semi-conscious on Epsom Downs on June 2nd, 1920; the more usual causes of this condition on Derby Day were excluded and a diagnosis of infective endocarditis with right hemiplegia was established. The patient had a second cerebral embolus on Nov. 14th and died the next day. In a fourth case the first symptom was sudden blindness of the left eye due to an embolus of the central artery of the retina. Three patients died within a few hours of the first embolus; the notes of one case, a woman of 28, record "stooping down to unlace boots, fell down, brought in dead."

A study of the histories shows that there are four principal groups of symptoms by which the disease first shows itself—viz.: (1) symptoms referred to the heart; (2) symptoms of rheumatism; (3) symptoms of a febrile illness; and (4) symptoms of indefinite ill-health.

(1) *Cardiac.*—The first symptoms are those of chronic heart failure; the infective attack which brought about the damage to the heart has passed unnoticed. The patient complains of increasing breathlessness, cough, swelling of the feet; "pains over the heart," and occasionally palpitations are mentioned.

(2) *Rheumatic.*—The patient, who may or may not have had acute rheumatism before, has a definite feverish illness accompanied by painful joints. This does not subside when salicylates are given in full doses and eventually the diagnosis is revised. Some cases are less definite and pain in the limbs or in one particular joint is an incident in a general feeling of discomfort.

(3) *Influenzal or Febrile.*—The history is given that the patient had an attack of "influenza" some months or weeks previously and has not been well since; sometimes it is a "chill," or a "bad cold" from which the patient only partially recovers. In other cases a sudden attack of fever or shivering ushers in the final phase of the illness and causes the patient to seek treatment.

(4) *Indefinite Ill-health.*—The patient suffers from general malaise, weakness, and wasting, which continue and increase for several months. Feeling "queer," "run down," "sleepy," "languid," "out of sorts," are expressions used. One patient complained of feeling irritable. Headache, loss of energy, and insomnia are common; loss of weight is often mentioned, but there are no localised symptoms.

(5) The next most common group of cases is that in which *abdominal pain, vomiting,* and *diarrhœa* announce the presence of the illness. Sudden pain in the back recorded in four cases may be due to embolism.

The relative frequency with which the various initial symptoms were found is shown in Table V.

When the patient comes under observation the clinical picture is usually quite definite. He is pale and breathless on exertion and there may be œdema of the feet. The temperature is irregular, the heart considerably enlarged, particularly to the left, and there are loud murmurs generally at both mitral and aortic areas. One or more of [illegible] characteristic signs [illegible]: pa[illegible] [illegible]bing of the fingers, purpura, Osler nodes and other signs of embolism; last, and most important, is albuminuria, sometimes with hæmaturia and the presence of casts.

TABLE V.

Mode of onset.	Cases and Per cent.	Mode of onset.	Cases and Per cent.
Cardiac symptoms ..	54 (27)	Purpura .. 5 Hæmaturia .. 1	6 (3·0)
Pains in the joints and limbs ..	39 (19·5)	Sudden pain in back or neck	4 (2·0)
Febrile illness ..	35 (17·5)	Cough	3 (1·5)
Malaise and weakness	21 (10·5)	"Pleurisy" ..	3 (1·5)
Abdominal symptoms	14 (7·0)	Fainting and "collapse"	3 (1·5)
Cerebral embolus and hæmorrhage 10 Embolus of arteria centralis retinæ .. 1	11 (5·5)	Renal symptoms ..	2 (1·0)
		Unclassified ..	5 (2·5)
			200

Clinical and Pathological Features.

Perhaps it will be useful to consider in detail some of the more important clinical aspects of the disease, correlating them where possible with the pathological foundations.

1. The *general condition* of the patient is generally better than would be expected in so serious and long-continued an illness, and the symptoms are less evident than the physical signs. Euphoria is characteristic and the patients have none of the restlessness and anxiety associated with other cardiac conditions, but in spite of breathlessness, fever, or partial paralysis continue placid and contented with a firm belief in their ultimate recovery.

A man of 39 came to the hospital because his feet had swelled and he could not get his boots on. The disease was well advanced and he was told he was very ill, but after six weeks, as the swelling of the feet subsided with rest in bed, he went at his own request to a convalescent home and then returned to his work as a fish porter in Billingsgate Market—heavy work for a man with a failing heart, grossly enlarged spleen, nephritis, and fever. He continued for three months, getting up at 5 A.M. and going to bed in the afternoon as soon as his work was over. Even when he was obliged to return to hospital, where he spent the last three months of his life, he had a feeling of well-being and remained hopeful.

2. The *temperature* is irregular and is rarely of the remittent "septic" type associated with acute infective endocarditis. In the more chronic cases there are often long periods of apyrexia; one man was observed for six weeks with 99° F. as the maximum, and the only reaction after an injection of antistreptococcal serum was a rise to 100° F. Such cases are practically afebrile, but as most of the patients in this series were under observation in the later stages of their illness when fever is more common there was no instance in which the disease was observed for 14 days or more without an occasional rise to at least 99° or 100° F. In many of the less chronic cases the temperature occasionally rose to 102° or 103° F.; in others it was remittent with a maximum of 103° F. for a few days or a week and then fell irregularly; a rise to 104° F. was rather unusual. The irregularity of the fever is its main characteristic.

3. The *heart* is nearly always regular in its action and the rate of the beat is relatively slow in spite of two causes for acceleration—viz., heart failure and a streptococcal septicæmia. The rate in the chronic cases was about 70–90 per minute for weeks together, and often failed to rise in occasional attacks of pyrexia. In the subacute cases, when the temperature rose to 102° or 103° F., the pulse-rate was rarely over 120. Sometimes, but by no means always, it became rapid shortly before death. The heart is considerably enlarged to the left; loud murmurs are usually heard both at the mitral and aortic areas; signs of heart failure—œdema, ascites, and breathlessness—develop. Libman (1923) noted sternal tenderness in some of his cases, particularly late in the disease.

The *post-mortem appearances* of the heart correspond with the clinical findings.

(*a*) Hypertrophy of the cardiac muscle is constant, and the distribution in any case is compensatory to the particular interference with valvular function. Microscopic myocardial lesions are not uncommon and are embolic in origin; larger infarcts and areas of fibrosis are rare (Coombs 1921). In this series infarction or fibrosis occurred in 31 cases. (Table VII.)

(*b*) Pericarditis almost never occurs, but the remains of an extensive pericarditis due to rheumatism is sometimes found, whilst milk spots and fibrous tags, probably due to rheumatism, are extremely common.

(*c*) The endocarditis is a pure endocarditis, in contrast to rheumatic carditis where pericardium, myocardium, and endocardium are usually all affected. The mitral and aortic valves are generally both involved—in 63 per cent. in a series of 110 cases—though one valve alone or three or even all four may be attacked; the aortic valve is more often affected in endocarditis lenta than in rheumatism (Wauchope, 1928). It is noteworthy that in the seven cases due to the gonococcus, *B. influenzæ*, and *M. catarrhalis* the distribution of the endocarditis was rather different from that found in the streptococcal cases; the mitral valve was affected in each case; alone in five; the mitral severely and the aortic slightly in one (*B. influenzæ*); the mitral, aortic, and tricuspid in one (gonococcal). The affected valves are covered with polypoid vegetations, fibrinous and tough at the base, and in the more chronic cases impregnated with small particles of calcium. There is usually much destruction and considerable fibrosis of the valves. The mural endocardium adjacent to the affected valve is often involved. Mural endocarditis of the left auricle is frequent, and it is common to find endocarditis of the aortic cusps spreading on to the endocardium of the left ventricle.

4. *Kidneys.*—Albuminuria is the most constant clinical feature to be associated with the cardiac signs and pyrexia. It occurred in over 80 per cent. of these cases (see Table VI). In the majority it was due to nephritis which was present in 64 per cent. of the cases which came to autopsy; sometimes albuminuria was associated with back pressure kidney or simple parenchymatous degeneration. Hæmaturia, visible to the naked eye or microscopic, was noted in 43 per cent. of the cases; it may be due to nephritis when it is often associated with casts; to infarction, when it is temporary, or to purpura when it is profuse.

TABLE VI.—*Clinical Observations (excluding Cardiac Conditions).*

	Cases and Per cent.		Cases and Per cent.
Albuminuria ..	152 (81·7)*	Clubbing of the fingers	71 (35·5)
Hæmaturia ..	86 (46·2)*	Purpura	59 (29·5)
Palpable spleen ..	109 (57)†	Osler nodes	16 (8·0)
Gross embolism ..	99 (49·5)		

* 14 cases not tested. † 10 cases notes defective.

The nephritis is of two types: (1) A hæmorrhagic nephritis characterised by the so-called "focal embolic glomerular necrosis" of Löhlein (1910). It was described by Baehr (1912 and 1921), who studied the microscopic appearances of the kidneys and found this type of nephritis in subacute streptococcal endocarditis, but not in cases of endocarditis due to other organisms. (2) A diffuse hæmorrhagic nephritis without "focal necrosis" is present in other cases. Death from uræmia is a not uncommon termination.

5. *Spleen.*—Enlargement of the spleen is frequent and is an important diagnostic point. In the more chronic cases it is often very big, reaching as far down as the umbilicus. It was felt on clinical examination in 57 per cent. of these cases (Table VI.) and was certainly enlarged in a greater proportion. The percentage of cases in which at autopsy it was found to be 9 oz. or over in weight was 86 (normal 4–6 oz.). In 50·4 per cent. it weighed over 1 lb., in seven cases over 2 lb., and in one case 3 lb. 11 oz. The possibility of feeling it clinically depends on several things besides the degree of enlargement: (1) Careful and frequent examination; (2) the thickness of the patient's abdominal wall; (3) the condition of the

spleen itself. A hard, firm spleen is easily felt while a soft œdematous organ of much greater size cannot be defined—e.g., two spleens found to be 9 oz. on weight had been palpable during life, while in another case where the weight was 1 lb. 7½ oz. there was no indication of splenic enlargement before death.

In Prof. Turnbull's experience the spleen at necropsy is characteristically a chronically inflamed spleen. It is greatly enlarged and firm, and shows upon the cut surface trabeculæ and enlarged Malpighian bodies. Microscopically the pulp shows an infiltration of a chronic type, the majority of the infiltrating cells being plasma cells and large mononuclear cells with deeply basophil cytoplasm. Occasionally, however, in the typically chronic cases a spleen showing little or no enlargement is found at necropsy. Death is then due to heart failure and the spleen is of the "back pressure" variety. It appears, therefore, that the inflammation and consequent enlargement of the spleen may diminish in intermissions of the bacteriæmia; such intermissions can be recognised on the temperature chart during life. These variations in the bacteriæmia and consequent size of the spleen can explain failure to palpate the organ or discrepancies between clinical and post-mortem findings.

In a number of cases pain in the splenic area was followed by a rapid enlargement of the organ and infarcts were found after death. If these events are correlated the enlargement must be due to œdema or inflammation caused by the embolism and not to the infarct itself, which is not larger than the healthy tissue it replaces. Post-mortem infarcts are found more often in the spleen than in any other organ (see Table VII.).

TABLE VII.—*Embolic Lesions Found at Autopsy.*

Infarcts in Solid Organs.

	Cases and Per cent.*
Spleen	95 (72·5)
Kidneys	88 (67·2)
Myocardium	31 (23·7)
Lungs	14 (10·7)

* Percentage in 131 autopsies.

Emboli and Thrombi in Blood-vessels.

	Cases.
Cerebral arteries	14
Intestinal arteries	6
Iliac and femoral arteries	4
Brachial and radial arteries	2
Central artery of the retina	1
Internal jugular and innominate veins	1
Iliac and femoral veins	2
Right lateral sinus	1
Prostatic vein	1

Aneurysms Due to Direct Extension of the Infection.

	Cases.
Aorta and sinuses of Valsalva	6

Embolic Aneurysms.

Intestinal arteries—		
Mesenteric	10	14
Ileo-colic	4	
Cerebral arteries—		
Right middle cerebral	6	10
Left middle cerebral	2	
Left anterior cerebral	1	
Arachnoid artery in left parietal lobe	1	
Hepatic artery		1
Renal artery		1
Coronary artery		1

False Aneurysms.

Arteria profunda femoris	1
Posterior tibial artery	1

6. *Embolic phenomena* are an important part of the disease. Instances have been given of cases in which they provide the first symptom; more often they cause striking incidents in the course of the illness. Attacks of renal pain followed by hæmaturia; pain in the left hypochondrium followed by rapid enlargement of the spleen; cough with expectoration of blood-stained sputum—a definite hæmoptysis occurred in four patients—attacks of gastro-enteritis with abdominal pain, associated with embolism or thrombosis of the mesenteric or cœliac arteries. In all these instances and in the cases of hemiplegia the clinical signs and the post-mortem findings are correlated—for instance, in an unusual case of a woman aged 26 swelling of the right arm appeared six days before death, followed by great and increasing œdema, and at the autopsy thrombosis of the right internal jugular vein and innominate vein was found. In the myocardium, however, although infarction and fibrosis are fairly common at autopsy, it is rare to find any clinical record of the actual attack. Table VII. shows the localisation of the emboli in the London Hospital cases.

Embolic aneurysms are not uncommon, and one remarkable case must be recorded.

A girl of 13 was admitted to hospital on April 10th with one week's history of severe abdominal pain. A nodule was present just above and to the right of the umbilicus. This disappeared, but in May returned and increased in size. The patient's symptoms, however, subsided, and she was discharged in June. Six weeks later she was readmitted, complaining of "a lump in the stomach." The nodule was now 2 in. in diameter, was movable, hard and dull on percussion. It was not fluctuating and non-pulsatile. The provisional diagnosis lay between a retroperitoneal sarcoma and tuberculous adenitis. Signs of endocarditis were present, but the child had had two attacks of rheumatic fever and the blood culture was sterile. Laparotomy was performed under stovain. An aneurysm of the mesenteric artery burst as soon as the peritoneum was opened and the patient died an hour later. Post mortem an infective aneurysm (10 × 5 × 6 cm.) was found replacing the superior mesenteric artery 4 cm. from its origin. Infective endocarditis of mitral and aortic valves was present with the usual associated conditions of the kidneys, spleen, &c.

Post-mortem embolic aneurysms were found in the distribution shown in Table VII.

Embolic lesions of great diagnostic value are Osler nodes. These are red raised painful spots which occur on the fingers and toes and last for a few days. They were noted in only 8 per cent. of the London Hospital cases (Table VI.).

7. *Clubbing of the fingers* is an interesting phenomenon which seems in these cases to depend on the toxæmia more than on a mechanical defect in the circulation. It has been observed to diminish (Libman, 1925), but in general depends on the duration of the disease. It was noted in 35·5 per cent. of the London Hospital cases (Table VI.).

8. *Blood Conditions.*—The anæmia is a slowly progressive secondary anæmia. In one chronic case the red cells were 3,140,000 and the hæmoglobin 55 per cent. in May, while in December the red cells were 2,100,000 and the hæmoglobin 35 per cent. In another the count was 4,300,000 in April and 3,200,000 in June. The lowest count in the series was 1,200,000 with 30 per cent. hæmoglobin, while in 86·4 per cent. of those examined the red cell count was under five millions. In three cases (5 per cent. of those examined) there were over six million red cells, in one the count was made about a month before death, the other two were discharged with symptoms improved, but physical signs unchanged. The anæmia sometimes leads to the "earthy" or café au lait" complexion mentioned in the literature. Amenorrhœa unconnected with pregnancy was noted in 16 (23·9 per cent.) of the women. Leucocytosis is not characteristic; it was found in only 25·4 per cent. of the counts made and was often slight—e.g., 11,000 or 12,000 white cells with a relative polymorphonuclear increase up to about 85 per cent. In one case there were 35,999 white cells with only 35 per cent. of polymorphonuclear cells and 37 per cent. myeloblasts, an unusual complication. Leukopenia is more common than leucocytosis, and occurred in 58·7 per cent. of the cases examined, the lowest count of 1920 white cells, of which 44·5 per cent. were polymorphonuclear cells, was associated with a very low red cell count. Purpura was noted in 20·5 per cent. of these cases, and is probably a result of the bacteriæmia, though it may be due to anæmia; it usually occurs as crops of petechiæ; allied manifestations are *epistaxis, retinal* and *subconjunctival hæmorrhage, melæna, hæmaturia,* and *bleeding of the gums.* In one long-continued case all these were noted at different times except bleeding of the gums. A cutaneous eruption of "free hæmorrhagic bullæ over the face and arms" was described by Coombs (1921) and is probably analogous to the purpura and other hæmorrhagic occurrences. It was observed in three of the London Hospital patients and was in each case diagnosed as a halogen rash. Dermatologists recognise that patients suffering from severe cardiac and renal disease are particularly liable to this type of iodide eruption (Sequeira, 1927), and in each of the three cases the amount of iodide given was small and the patient was seriously ill.

In one case the eruption appeared after grs. 90 of potassium iodide taken in gr. 10 doses three times a day. It was symmetrical, beginning as purpuric papules, and developed into hæmorrhagic vesicles about the size of a sixpence surrounded by purpuric patches. It began to fade on the fourth day (the iodide had been suspended) and the patient died eight days after its appearance.

For another patient, a woman, potassium iodide, grs. 5 three times a day, was ordered on May 18th for four days; the rash appeared on May 21st and was still present on May 29th; the patient died on June 11th.

The third patient, like the first, was a man. He was ordered grs. 3 of potassium iodide three times a day for three weeks as an out-patient. The iodide was then apparently suspended, and when the patient was admitted a week later the eruption was present. He died four days after admission.

Diagnosis.

Diagnosis is not usually difficult, but sometimes one aspect of the case predominates and may mislead for a time.

1. *Acute rheumatism* is a frequent early diagnosis, and those cases which first come under observation with pains in the joints, fever, and a cardiac lesion are indistinguishable from rheumatism until the therapeutic test of administering salicylates is applied, unless, of course, an enlarged spleen or other complication raises a doubt. Albuminuria and purpura may be associated with rheumatic endocarditis; clubbing of the fingers may be present if the heart was severely damaged by a first attack in childhood; embolism occasionally occurs but Osler nodes are said to be diagnostic of endocarditis lenta and to occur in no other disease.

2. Some cases resemble *typhoid fever*—e.g., that of a woman of 25 who had an illness diagnosed as influenza four months before admission to the hospital and had been "languid and out of sorts" since. She complained of headache, pains in the legs, sweating, and diarrhœa. The tongue was heavily furred and the spleen was palpable, the temperature was irregular, rising to 103° F., and leukopenia completed the picture. There was a mitral systolic murmur and clubbing of the fingers which could be accounted for by an attack of rheumatism at the age of 16. The Widal reaction was, however, negative, and the blood culture grew non-hæmolytic streptococci on two occasions. Autopsy revealed typical lesions of the aortic and mitral valves, subacute lipoid nephritis, and splenic and renal infarcts.

3. Gastro-intestinal symptoms dependent on large emboli have led to a diagnosis of *acute gastro-enteritis* and even simulated *intestinal obstruction.*

4. Cerebral embolism and hæmorrhage are puzzling if the patient is unconscious when first seen.

5. Sometimes the evidence of renal disease and uræmia lead to a diagnosis of *nephritis*, the underlying cause being overlooked.

6. An *aneurysm* may be the presenting sign, as in the case quoted of an abdominal tumour and in the case of a man of 24 who was admitted with a large swelling in the thigh which proved to be a false aneurysm connected with the arteria profunda femoris.

Prognosis and Treatment.

Prognosis is regarded in this country as practically hopeless. Only 33 (16·5 per cent.) of these patients did not die while under observation; four were definitely worse on discharge and none showed any real signs of recovery, though in eight the symptoms were alleviated. Libman (1925), however, records at least ten cases of recovery, one patient being free from all symptoms as long as 11 years after definite signs of the disease, including Osler nodes and a positive blood culture had been observed.

Treatment has so far proved futile. Vaccines, serums, intravenous medication with colloidal metals, colloidal iodine, mercurochrome, arsenic and its derivatives, especially sodium cacodylate, have all been tried. The oral administration of sodium sulphocarbolate was at one time popular. Blood transfusion may improve the general condition, but has no specific action. No treatment appears to have any permanent beneficial effect; the best result obtained was a temporary lowering of the temperature. At present our power to help is limited to general treatment, open air, and attention to the patient's comfort and happiness, and I do not think that we should be deterred by fear of embolism from allowing the patient to lead as active and normal a life as he feels inclined to do. Emboli occur even in bed and, on the other hand, a sudden death or the curtailment of a few weeks of life is in many cases to be preferred to the death from progressive heart failure, toxæmia, or uræmia, which will inevitably occur.

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SPLENIC ANÆMIA.

THE NECESSITY FOR EARLY OPERATION.

BY A. CECIL ALPORT, M.D. EDIN., M.R.C.P. LOND.,
ASSISTANT IN THE MEDICAL UNIT AT ST. MARY'S HOSPITAL.

SPLENIC anæmia, as a clinical entity, was first described by Gretzel in 1866, and later in the same year the name "splenic anæmia" was given to the disease by Griessinger. The condition is characterised by an enlarged spleen, secondary anæmia, leucopenia and, as a rule, a relative lymphocytosis.

In 1883 Banti, of Florence, first described the phase of the disease which goes by his name. Banti's disease is merely a late stage of splenic anæmia complicated by cirrhosis of the liver. Banti's hypothesis is that there is a primary splenomegaly due to an infective agent, and that the splenic enlargement itself produces another toxin which, acting on the liver and on the splenic veins, produces the changes found in Banti's disease, the anæmia being the result partly of toxæmia and partly of hæmorrhage.

Naunyn and others consider that splenic anæmia is primarily a cirrhosis of the liver, and that the enlargement of the spleen is always secondary to early changes in the liver. Osler and McCrae[1] describe splenic anæmia as "a disease of the spleen of unknown origin characterised by progressive enlargement, anæmia, a tendency to hæmorrhage, and in some cases a secondary cirrhosis of the liver with jaundice and ascites. That the spleen itself is the real seat of the disease is shown by the fact that complete recovery may follow its removal." There can be no doubt that Osler's reasoning is sound, and that the disease is primarily splenic in origin. It is probably the result of a toxin from some infective process located in the spleen. Thursfield[2] states that it is certain there are cases of splenic anæmia where the stage of cirrhosis is never reached, and that the termination of the disease may be either fatal anæmia or an equally fatal cirrhosis.

The question of splenectomy in the treatment of splenic anæmia is thus of the greatest importance. Pearce, Krumbhaar, and Frazier[3] state that as a general fundamental principle the best results from splenectomy are obtained in those diseases in which there is evidence of increased blood destruction. Such cases would include hæmolytic jaundice and splenic anæmia, and also Gaucher's disease, von Jaksch's disease, and pernicious anæmia, in which splenectomy has been tried.

To obtain satisfactory results in splenic anæmia, early operation is absolutely essential. If there is definite impairment of hepatic efficiency, splenectomy is contra-indicated because of its dangers. Even if the spleen be successfully removed in splenic anæmia with cirrhosis of the liver (Banti's disease), the secondary changes in the liver are not influenced and the hepatic degeneration continues, although the progress of the disease is retarded and the life of the patient prolonged. This accounts for the necessity for operation as early as possible. The greatest care should be taken before operation to eliminate the atypical forms of leukæmia. Splenic anæmia was described by H. C. Wood in 1871 as the splenic form of pseudo-leukæmia. Splenectomy in leukæmia almost invariably results in the death of the patient. A. van Verts, in 1898, collected 25 cases of splenectomy in leukæmia, and C. Fevrier, in 1901, two cases. Of these only three survived, and Banti himself considered that one of the latter, Franzolini's case, was really a case of Banti's disease and not leukæmia at all.

Two Contrasting Cases.

The results of splenectomy in the two cases described below have a definite bearing upon the question of early operation in cases of Banti's disease, and as such are, I think, worth recording. They are the more interesting in that they are familial. The patients were sisters; both developed splenic anæmia followed by liver changes, and both had splenectomy performed. The one operated upon in the early stages of liver involvement recovered; the other, suffering from more advanced hepatic changes, died.

CASE 1, *aged 35 years, married*, was admitted under Prof. F. Langmead to the medical unit wards of St. Mary's Hospital on April 13th, 1926. She had had ulcers in the mouth and pallor since girlhood, and a lump in the abdomen since 1918. In January, 1926, she had had a labour induced owing to the impossibility of full-time delivery; the baby was dead. Afterwards "she was delirious for a week," and was told at the time that "her kidneys were bad." Her father had Bright's disease, and two brothers had died of tuberculosis.

On admission her general condition was fairly good, but her colour sallow. A blood examination gave the following result: red cells, 4,288,000 per c.mm.; white cells, 2500 per c.mm.; hæmoglobin, 58 per cent.; colour-index, 0·68; polymorphonuclear leucocytes, 78 per cent.; small lymphocytes, 12 per cent.; large lymphocytes, 0 per cent.; eosinophils, 1 per cent.; nucleated red cells and some immature leucocytes present; Wassermann reaction negative. There was no enlargement of glands, but the spleen was much enlarged, the lower pole reaching well below the umbilicus in the right iliac fossa. The liver dullness was diminished and the hepatic efficiency impaired. Banti's disease was diagnosed.

On June 3rd, 1926, splenectomy was performed by Prof. C. A. Pannett. The spleen showed peri-splenitis and was very adherent. The splenic and inferior mesenteric veins were enormously dilated, and there was considerable loss of blood during the operation. The patient afterwards was much shocked and remained semi-comatose until June 5th, when she sank into deep coma (cholæmia) and died.

The spleen was firm, dark red, and about seven times the normal size, weighing 1700 g. The liver was small, thin, dark in colour, and about two-thirds of the normal size. The surface was roughened and thickened in places, and the portal and splenic veins were thrombosed.

It should be noted that this patient was sent into hospital eight years after a "lump" had been discovered in her abdomen, and the only means of prolonging her life was successful splenectomy. Before her operation we had had in the wards a case of Banti's disease with cirrhosis of the liver and ascites, which had been operated upon with excellent results. In these advanced cases, however, the operative risk is always greatly increased, and it is a short-sighted policy to postpone the consideration of splenectomy for years, until the only alternatives are a painful lingering death on the one hand, or the risk of a fatal result to the operation on the other.

CASE 2, aged 42 years, married, had had slight anæmia for five years. In December, 1926, she began to feel ill, her menstrual periods occurred every fortnight, and lasted for five to seven days, and she became more anæmic. She was kept in bed for three months by the doctor, who told her she had an enlarged spleen. In April, 1927, she had a severe uterine hæmorrhage, and was in bed for five weeks as a result. In October, 1927, she came to London to see a specialist, who advised admission to hospital, but she refused. On April 23rd, 1928, she was sent by her doctor to consult me. She had pain and swelling on the left side of the abdomen, did not feel fit, and was unable to carry on her work. The spleen was enlarged down to the umbilicus. The liver was not palpable; on percussion the lower level of the hepatic dullness was found two fingers' breadth above the costal margin. Blood examination gave the following result: red cells, 4,608,000; white cells, 3100; hæmoglobin, 70 per cent.: colour-index, 0·76; poikilocytosis and anisocytosis present; polymorphonuclear leucocytes, 76 per cent.; large lymphocytes, 5 per cent.; small lymphocytes, 12 per cent.; neutrophil myelocytes, 3 per cent.; transitionals, 4 per cent.; coagulation time of blood, two minutes. Routine examination of the urine revealed 0·64 per cent. of sugar, but no acetone or diacetic acid. After 50 g. of glucose had been taken the blood-sugar rose from its fasting level of 0·117 per cent. to 0·246 per cent. in one hour, 0·32 per cent. in an hour and a half, and to 0·255 per cent. in two hours. The Wassermann reaction was negative. X ray showed shadows in both antra of Highmore and on washing-out flakes of mucus were found.

I recommended immediate admission to hospital and splenectomy, but, although the patient herself was prepared to undergo the operation, her relatives refused to consider it on account of the fatal result in her sister's case. From time to time during the next five months I unsuccessfully urged operation. On Oct. 3rd, 1928, she agreed to come into St. Mary's Hospital for liver efficiency tests. A definite amount of urobilin was found in all the specimens of urine, suggesting some impairment of liver function. 40 g. of pure galactose, with a rotatory power of not less than 76, were given. The amount of sugar passed in the urine during the next three hours amounted to 2·61 g. The normal amount would be 1·5 to 3 g. in the first three hours. In definitely *disordered hepatic function the sugar passed in the first* three hours is 3 g. or more. In advanced cirrhosis of the liver it may be as much as 30 g.

Blood-sugar.	Fasting.	One hour.	Two hours.
(*a*) Normal case	0·085	0·11	0·09
(*b*) In cirrhosis	0·08	0·19	0·37
(*c*) In patient's case ..	0·07	0·134	0·134

As the *urinary sugar* was within the normal limits I recommended an exploratory laparotomy for the purpose of examining the condition of the spleen and, more particularly, of the liver. If the latter showed any definite degree of cirrhosis, splenectomy would not be attempted. The patient was prepared to agree to this, but again her relatives and friends persuaded her to refuse operation. She left the hospital after a week, and I was forced to desist from any further attempts to get the spleen removed. Before she left, however, I again explained the situation very plainly to her. If she underwent the operation successfully there was the prospect of good health for many years. On the other hand, like her sister, she might not survive the operation for more than a few days. The third alternative was no operation, with the prospect of gradual deterioration, the possibility of a sudden fatal hæmorrhage, and at the best a lease of life of not more than four years.

The choice was one not easily made, but ten days later she appeared at the hospital prepared for immediate operation. She had overcome the opposition of her family by pointing out that if, because of them, she did not undergo the operation, she would, when she was dying in two or three years' time, ask them why they had prevented her from seizing the opportunity of recovery whilst there was still time. Under the circumstances her action was a very brave one. On Oct. 18th, 1928, she was operated upon by Prof. Pannett, under a general anæsthetic, C_2E_3 and open ether.

Deep anæsthesia had to be induced by using chloroform for a few minutes, but chloroform is absolutely contra-indicated in cases with any degree of cirrhosis of the liver on account of its degenerative effect on the liver cells.

A left paramedian incision was made, the peritoneal cavity opened, and the abdominal contents examined. There was very little evident cirrhosis of the liver, although the organ was smaller than normal, and it was decided that it would be safe to proceed with splenectomy. The spleen was bound down by adhesions on the anterior surface of the lower pole, the pedicle, and the upper pole. The vessels in the adhesion were much enlarged and were ligatured and divided in the usual way, and the hæmorrhage on the whole was not very severe. On account of the density of the adhesions the operation took nearly an hour and a half, which is another strong argument in favour of early surgical interference in these cases. There was a considerable degree of shock, but on the whole the patient stood the operation fairly well. On her return to the ward her pulse-rate was 132, and she was given three pints of saline per rectum and an injection of morphia gr. ¼. The next day, Oct. 19th, she was very drowsy and difficult to rouse. She was given 500 c.cm. of intravenous saline, with 5 per cent. glucose, followed by 10 units of insulin. She suffered from very severe dyspnœa and a pulse-rate of 136; atropin gr. 1/150 was given hypodermically, and rectal salines with 5 per cent. glucose four-hourly during the night. There was slight improvement in the morning. On the 20th she experienced much discomfort from abdominal distension, but the flatulence was relieved by a turpentine enema. Her temperature was 101° F., and her pulse-rate 88. Next day she had severe præcordial pain, and on the 22nd was again very drowsy and of a bad colour, with a temperature of 102° and a pulse-rate of 88. Saline with glucose was given per rectum. Examination of the lungs showed only a few moist râles at the bases. On the 27th she complained of pain in the left groin and very severe headache. On the 28th she was very drowsy again during the day and fatigued at night. The stitches were removed on the 30th; the wound had healed perfectly. She still had great pain in the left groin, but no evidence of femoral thrombosis.

By Nov. 4th her general condition was slowly improving. Her temperature fell to normal for the first time, but she continued to have rises of temperature, up to 100·6° until the 24th, due, no doubt, to gradual absorption of toxic products from the thrombosed gastro-splenic vessels.

A blood count taken on Nov 29th showed red cells, 4,600,000 per c.mm.; white cells, 10,600 per c.mm.; hæmoglobin, 70 per cent.; colour-index, 0·76; polymorphonuclear leucocytes, 52 per cent.; large lymphocytes, 5 per cent.; small lymphocytes, 28 per cent.; transitionals, 6 per cent.; neutrophil myelocytes, 8 per cent.; large hyalines, 1 per cent. It will be seen that the red count remains the same, but the white cells have increased from 3300 to 10,600 per c.mm. On Dec. 4th 40 g. of galactose were given, and 3·69 g. of sugar were passed in the urine during the first three hours. The blood-sugar rose from its fasting level of 0·055 per cent. to 0·08 per cent. one hour, and 0·111 per cent. two hours after galactose.

Pathological report on spleen.—"Typical spleen of venous obstruction. The veins are greatly enlarged and thick-walled. Throughout the pulp the venous spaces are dilated and surrounded by fibrous tissue. Malpighian bodies small. No sign of streptothrix seen." Immediately after its removal an attempt was made by Dr. Leonard Colebrook to obtain a culture from the spleen of the streptothrix suggested by Alexander Gibson, of Oxford, as a possible cause of splenic anæmia, but the result was negative.

The patient was discharged on Dec. 5th and is making good progress.

Cases of complete cure of splenic anæmia after splenectomy have been recorded in the literature, but the operation must be performed in the very earliest stages, before the liver becomes involved. The prognosis becomes progressively more serious with the onset and advance of hepatic cirrhosis and, moreover, removal of the spleen in such cases does not prevent the gradual spread of the degenerative changes in the liver cells. Notwithstanding this, however, the spleen should be removed as soon as possible after the diagnosis has been made, if liver-tolerance tests show that hepatic efficiency is not much impaired, the reason for this being that the expectation of life is much greater after successful operation. In the early stages of splenic anæmia splenectomy is a relatively simple matter, for there is not much enlargement of the spleen and comparatively few adhesions; in the later stages the operation is a long and difficult one, and the operative mortality is heavy. It is essential also to remember that chloroform as an anæsthetic is contra-indicated in splenectomy if the liver function is in any way impaired.

The longer the physician hesitates before calling in a surgeon the less chance will the patient have of recovery. The diagnosis should be made as soon as possible, and no effort on the part of the practitioner should be spared to persuade the patient to undergo early operation. Having done this his responsibility ceases, but it is unfair to the surgeon and still less fair to the patient to delay consideration of splenectomy until the liver has undergone degenerative changes and the operative risk has become serious.

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COMPLICATIONS OF TONSILLECTOMY IN CHILDHOOD.

BY A. G. OGILVIE, M.B. DURH.,
MEDICAL REGISTRAR, ROYAL VICTORIA INFIRMARY, NEWCASTLE-ON-TYNE; LATE HOUSE PHYSICIAN, HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET, LONDON.

TONSILLECTOMY is now firmly established as a valuable prophylactic and therapeutic measure, and is more widely advocated and performed at the present time than ever before. It has therefore seemed well to undertake a brief clinical review of such complications as occur, and to discuss their course and prognosis. The very infrequency, relatively speaking, of these illnesses gives point to such an investigation, as in ordinary practice personal experience of uncommon conditions naturally grows slowly, while few general clinical reviews of this subject have appeared in this country.

This paper is based on the in-patient records of the Hospital for Sick Children, Great Ormond-street. At that hospital over 5000 cases are operated on every year by the method of dissection introduced by Mr. G. E. Waugh. This method produces more satisfactory results than any other, as is now generally recognised. A very considerable proportion of the cases of complication included here, about half, had been operated on elsewhere by various methods. The years 1922 to 1927 inclusive were chosen as being the most useful, as it is only recently that the operation has been performed so extensively all over the country.

Nature and Incidence of the Complications.

It is first of all necessary to define the term "complication of tonsillectomy." An illness has here been accepted as a complication which quite definitely has begun within 24 hours of operation, whether its onset be insidious or abrupt; it must be severe enough to confine the child to bed for 24 hours or longer. When the operation has been undertaken for the relief of a disease already present any exacerbation of the illness occurring within 24 hours of operation is accepted as a complication. It is believed that this criterion is sufficiently accurate for the purpose.

No statistical conclusions are given as it is not claimed that every case of complication admitted to the hospital in the six years under review has been traced. In addition, very many of the cases were not operated on at the Hospital for Sick Children. The cases of complication following tonsillectomy which are seen from time to time in the wards of a children's hospital are apt to impress one unduly with their apparent frequency. A series of cases of post-tonsillectomy pneumonia seen shortly before this investigation was begun had created such an impression in my mind, but a careful search through the records revealed the real rarity of such cases together with the fact that they, like others, tend to occur in "runs."

The very fact that both physicians and surgeons can recall off-hand two or three complications of tonsillectomy, with dates, names, and details, supports this view. It is the rarity that stands out most clearly in one's memory.

The conclusion to which this investigation has led, therefore, is that tonsillectomy, performed according to Waugh's method, is a safe operation, though complications occasionally occur which may be serious, and rarely are fatal. It will be seen that the prognosis of these illnesses is usually good, recovery in the great majority of cases being rapid and complete.

It will suffice to indicate the course which complicated cases may be expected to follow, and the developments which may occur and should be watched for.

The *milder complications* are the most frequent. Surgical shock, always slight in this series, ketosis with occasional transient glycosuria, tachycardia, cervical adenitis, feverish cold, and post-tonsillectomy debility are included in this group. These cases all do well and give rise to little or no anxiety. Abscess very occasionally results from cervical adenitis (one case in this series) and a stay at a convalescent home may be necessary to cure post-operative debility; but the overwhelming majority, though ill enough to be kept in bed for a few days, make a complete recovery within 72 hours. Most of these illnesses follow directly on the operation, but an interval of 24 hours may elapse. A word may be added with regard to tachycardia. The condition is rare, but quite definite; the children are not shocked and appear quite well; ketosis is absent or very slight; and the temperature is normal except perhaps the first day. A pulse of 150–200 may be maintained for five to seven days, falling to normal by rapid lysis. Possibly this is a sympathetic effect. It must be understood, of course, that the discovery of ketones in the urine, or the general picture of shock or debility, does not absolve the practitioner from a search for evidence of more serious mischief. This will be mentioned again later.

There are a number of complications of slightly more serious import which may be discussed together. This group includes hæmorrhage, hysterical manifestations, acute gastro-enteritis, and otitis media. Primary hæmorrhage seems to be more important than secondary hæmorrhage, which was always mild and easily checked, but the majority of all cases are readily controlled by adequate treatment and do not require to stay in hospital longer than a week. One child, a boy aged 5, after a moderately severe primary hæmorrhage, passed obvious blood in the stools for nearly three weeks afterwards, but was never seriously ill. One death occurred.

The child who died was a girl of 3½ who was believed to be a case of so-called pseudo-hæmophilia. Her sister suffered from a similar condition and also died of hæmorrhage. The case was therefore thoroughly investigated.

Willebrand[1] has described a family with 23 bleeders in 66 members in four generations. The coagulation time is normal, but the bleeding time greatly prolonged. The platelets were down to 55,000 in some cases, though normal in others, but a purpuric tendency was definite in all.

Secondary Anæmia.—Certain cases of secondary anæmia of varying degree may be mentioned here. These all followed post-operative hæmorrhage, but comprised only a small proportion of the hæmorrhage cases. It is believed that these are cases of post-operative debility, complicated at the beginning by hæmorrhage. The red blood corpuscles are only moderately reduced, 3,500,000 to 4,000,000 per c.mm. being a usual figure. The main feature is the marked reduction of the hæmoglobin, which is often below 20 per cent. The anæmia is readily cured by the administration of iron, but the debility often necessitates a month or so at a convalescent home.

Hysterical manifestations, which here include chorea, are occasional and transient, and resolve completely. Cases of persistent vomiting without ketosis or other cause, dysphagia, and anorexia occurred, and all the patients were discharged cured within a fortnight. Special mention may be made of chorea. It is a striking fact that in the six years covered by this article only one case of chorea could be attributed to tonsillectomy, and this was discharged cured in seven weeks; while of a large number of established cases of chorea operated upon only one was made worse by tonsillectomy, and that only temporarily. Most were definitely improved by the operation.

Acute gastro-enteritis is rare, and rapidly cured. The onset may be with meningismus and fever. This may, however, occur as a secondary manifestation of *otitis media*, or other infection. Otitis media itself must receive special attention. The cases here discussed were admitted six to eight days after operation, because they were "not doing well." Aural discharge occurred on the day of admission, or the day after, in cases where myringotomy was not performed on admission. The prognosis was good, the discharge ceasing completely in two or three weeks, though occasionally a mastoid abscess followed. All the cases did well, and no case of cerebral abscess or meningitis occurred. This is decidedly one of the commoner complications.

Renal Complications.—Acute hæmorrhagic nephritis is the typical lesion, and ten such cases occurred in the period under discussion. The onset is sudden, with fever and general malaise, and occurs seven to ten days after operation. The interval after operation is not one of perfect health, the clinical picture suggesting slight post-operative debility and comprising lassitude and poor appetite. Occasionally the nephritis is merely a manifestation of a general septicæmia, and the prognosis is the prognosis of the graver condition. In uncomplicated cases the prognosis is excellent, as is typical of this illness generally. The blood-urea is not high (27–35 mg. per 100 c.cm.), and recovery is complete. One case remained in hospital nine weeks before the urine was reported clear, but this was exceptional. Two to three weeks was the usual period.

Pyelitis did not occur in this series, though one case of chronic parenchymatous nephritis, in which an exacerbation was induced by tonsillectomy, had blood and pus in the urine for ten days or so. This patient made a good recovery, and was discharged free of œdema and albuminuria; such exacerbations were uncommon. Cervical adenitis preceded the onset in one case by two days.

Septicæmia (*Septico-pyæmia*) is a grave complication, of which six examples were found. The children were "unwell" following operation for two or three days, this interval being followed by a sudden rise of temperature to 103° or 104° F., and the rapid development of an urgent illness. A feature of these cases was the early development of multiple local manifestations such as hæmorrhagic nephritis, otitis media, lobar or broncho-pneumonia, and empyema. In only one case were local manifestations absent, and it is of interest that this case comprised the only death in this group, the illness lasting 48 hours only. The development of local manifestations, therefore, however alarming in themselves, may be taken as by no means so alarming a feature in considering prognosis. Recovery in the five cases mentioned was complete in four or five months, only one patient having a trace of albumin in the urine on discharge. Pneumococci were grown from the blood in three cases, and in the remaining cases streptococci were grown from the urine during life, and in the fatal case from the heart's blood also.

Pulmonary complications were various, but the commonest were lobar pneumonia and bronchitis. Twelve cases of pneumonia and 21 cases of bronchitis occurred in this series.

Cases of lobar pneumonia were admitted, or readmitted, either directly after operation or within 48 hours. The result was uniformly good, the temperature falling by crisis on the third, fourth, or fifth day. Only one case of delayed resolution was discovered. The illness generally was always shorter

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Willebrand, E. A. von: Finska Läksällsk. Handl., Helsingfors, 1926, lxviii., 87 (abstract of paper: Amer. Jour. Dis. Child., 1926, xxxii., 763).

and milder than ordinary lobar pneumonia, and the question arises as to whether these cases are true pneumonia at all. It is likely that different factors operate in different cases. Some are probably cases of bronchitis or mild blood infection associated with partial collapse of one lobe due to inhaled blood-clot; others may be ether pneumonias, while others again are almost certainly true lobar pneumonia. The part played by chill is difficult to assess, but it is worthy of note that nearly as many cases occurred following operations performed in the six summer months as in the winter and early spring.

Secondary complications of pneumonia occasionally occurred. A few cases of otitis media and two of empyema were noted. Other cases with multiple complications were really septicæmias, the pneumonia being as much secondary to the blood infection as the other manifestations. Broncho-pneumonia is unusual, only two cases apart from septicæmia being observed.

One of these followed directly on operation, and this case recovered completely in three weeks. The other, which was referred from outside, had evidently been operated on in the prodromal stage of measles. The child, a girl of 3½, was admitted three days after operation, exceedingly ill, with extensive broncho-pneumonia and an early measles rash. This child died after an illness of eight days. The part played by operation is difficult to state fairly, but one may say that the operation was prejudicial to the health of the child under the circumstances.

This case is a useful reminder of the necessity of reconsidering every case immediately before operation. A slight rise of temperature, with mild symptoms of disturbed health, ought to cause either the postponement of the operation or careful reconsideration of the case.

Bronchitis was frequent, uniformly mild, and nearly always rapidly and completely recovered from. It usually followed directly on the operation, and a week at most sufficed for cure. The most important point in this connexion is the occurrence of bronchiectasis. Contrary to what was expected, only one case of bronchiectasis could be attributed to tonsillectomy in six years.

This child had a history of bronchitis following operation which was slow in clearing, and which was followed by further attacks at intervals of several weeks, until admission three months after operation. There was then an established bronchiectasis and the child, a boy aged 2¼, died of a terminal septic broncho-pneumonia two months after admission. Both lungs were extensively involved. Bronchitis following tonsillectomy should clear rapidly, and any case which is slow in recovering may be suspected.

No case of pulmonary abscess was found. This complication is common in America though rare in this country. The use of local anæsthesia for tonsillectomy, which is popular in the United States, has been blamed for this, and with some reason.[2] There were six cases of empyema. In two of these no history of pneumonia was obtained, the only symptoms being those of "debility," with right shoulder pain in one case. One of these was a mixed pneumococcal and *Bacillus proteus* infection, and the other was streptococcal. Two cases were secondary to septicæmia, while two followed pneumonia. These were all pneumococcal. The prognosis may be regarded as good, more especially when one considers the uncertain outlook in cases of empyema in childhood generally. All these cases were treated by rib resection and drainage, and all were dry and healed inside four weeks with full expansion of the lung.

Acute Specific Fevers.—Two possible cases occurred, one of diphtheria and one of scarlet fever. The case of diphtheria followed directly on tonsillectomy, while the other began two days after operation, being diagnosed two days later. The relation of these cases to the operation may be denied, as both might be due to coincidence, but they are mentioned to illustrate the rarity of these illnesses after tonsillectomy, these being the only two in six years. It is, of course, possible that cases might be referred direct to a fever hospital, but it is unlikely that this would apply to more than half of them. It is worthy of special note that no case of post-diphtheritic palsy following tonsillectomy was reported at the Hospital for Sick Children in the six years under discussion.

Commentary.

If the condition of a child within 24 hours of operation is not satisfactory we know first of all that this may be due to hæmorrhage, surgical shock, or ketosis. Any one or more of these may be present, but even so, search should be made for evidence of other more important complications which may coexist at this stage. The temperature, pulse, and respiration may suggest pneumonia, and lead to an examination of the chest for evidence of this or of bronchitis, although a negative result cannot exclude either.

Pyrexia, without evidence of any of the above, suggests a close watch for evidence of scarlet fever or diphtheria, and an examination of the mouth for Koplik's spots, this last more especially in the presence of acute coryza. Even if these illnesses are incidental only, they are nevertheless important to detect. As a last resort, post-tonsillectomy intoxication may explain the symptoms, and is a relatively common condition. Such conditions as shock, ketosis, and post-tonsillectomy intoxication improve rapidly under treatment, as we have seen, and should such improvement not occur, it is an indication for a re-examination of the chest for signs of pulmonary involvement. We know that otitis media, nephritis, and septicæmia are unlikely to provide evidence of their presence so early, but an examination of the ears and the urine is wise; while a high temperature with a decided change for the worse suggests septicæmia, and it is useful to remember in such a case that nephritis, pneumonia, and otitis media may all be secondary manifestations of this condition. The significance of cervical adenitis as a possible forerunner of acute nephritis may be helpful.

The next case for consideration is that of a child who has perhaps apparently recovered fairly well from the operation, but who is brought by his parents two to ten days after because he has been listless, irritable, and has refused his food, and has generally "not been doing well." The temperature will almost certainly be raised, perhaps to 99° or 100° F., perhaps higher. The operation wound may be dirty, probably with enlargement of the cervical glands, and this may be the explanation of the symptoms. Other complications, however, may occur at this stage, and these have to be excluded. Three investigations are here of first-rate importance—examination of the ears for acute otitis media; of the urine for blood, albumin, and casts; and of the chest for established pneumonia or early empyema. The possibility of septicæmia is again to be considered, with aural, renal, and pulmonary complications as local manifestations, though usually the high swinging fever with the rapid development of an urgent illness suggests the diagnosis. A blood culture may settle the question. In otitis media watch should be kept, as always in this condition, for the development of a mastoid abscess.

Considering the evidence of the cases previously quoted, a prognosis given at any time during the period just considered may justifiably be favourable, except in septicæmia where it must be guarded. This is assuming that no grave unforeseen development has occurred, when the prognosis must of necessity be modified.

Lastly, a child may be brought up for advice several weeks or even months after tonsillectomy with a history of ill-health dating from the operation. The most likely causes of such a history, assuming that we are satisfied of its connexion with the operation, are a developing bronchiectasis, perhaps with septic broncho-pneumonia, an overlooked empyema, chronic aural infection with possible mastoid involvement, or post-tonsillectomy debility with or without some degree of secondary anæmia. Subacute nephritis is rare, no case occurring in the present series, but can be excluded by a routine examination of the urine.

A definite history of bronchitis following an operation with frequent recurrent attacks since suggests developing bronchiectasis, or at least an examination of the chest. Empyema, however, may give rise to no symptoms beyond debility and some shortness of breath on exertion, and therefore examination of the lungs must be routine in these cases in any event. The ears will yield definite positive or negative information, and the slightest mastoid tenderness is significant. These cases, however, are uncommon. The prognosis of empyema appears to be favourable, as previously stated, but bronchiectasis as always is of grave significance. The only case in this series died five months after operation. No case of chronic aural infection was noted, but cases do occur, and their course is apparently much the same as is usual in this condition—namely, tedious and uncertain. As has previously been mentioned, the series contains no case of post-diphtheritic paralysis. This is of interest, as it is still widely held that this is one of the risks of the operation. That these cases occur is not here questioned. It is, however, contended that the danger has been very greatly exaggerated.

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[2] Ochsner, A., and Nesbitt, W.: Arch. Otolaryng., 1927, vi., 330.

It is hoped that this account of certain of the complications which may follow tonsillectomy will be helpful. The conclusion to which one must come on the evidence they supply is that not more than 1 in 200 cases of tonsillectomy suffers any ill-effects serious enough to confine the patient to bed as a result of the operation. Of these the majority are mild and readily overcome. The more serious complications are septicæmia, nephritis, and pneumonia, and may be expected within a week or ten days of operation, exceptions to this rule being bronchiectasis and empyema.

I wish to thank the honorary medical and surgical staff of the Hospital for Sick Children, Great Ormond-street, for kindly allowing me to make use of the records of the hospital.

NEW VIEWS ON THE TREATMENT OF HYPERTHYROIDISM WITH IODINE.

BY LUCIEN DAUTREBANDE, M.D., PH.D. EDIN.,
FONDATION REINE-ELISABETH, HÔPITAL BRUGMANN, BRUSSELS.

FEW methods of treatment have, at varying times, met with more changes of fortune than that of treating hyperthyroidism with iodine. Even though Coindet, as early as 1820, announced that he had discovered a new remedy for goitre in the iodine of certain kinds of seaweed, the treatment was practically abandoned until Trousseau, by chance, obtained proof of its favourable effects. He was called upon to treat a patient suffering from typical exophthalmic goitre whose pulse was particularly unsteady and rapid. Remembering that, while he might prescribe tincture of digitalis he must beware of iodine, by mistake he actually ordered several drops of iodine daily. Great was his astonishment when, a fortnight later, the patient returned to report that he had put on weight, was less nervous, had a much slower pulse, and was lauding the merits of tincture of iodine.

Up till about 1900 iodine was prescribed more and more for all forms of goitre, but from 1900 to 1912 the popularity of its use was greatly lessened by Kocher, who showed that colloid goitre with indurated nodules, or true adenomatous goitre, might present the symptoms of hyperthyroidism after the administration of iodine, although the patients had shown no trace of them beforehand. This syndrome was named "Iod-Basedow" by Kocher, and its demonstration was in great part responsible for the disfavour into which iodine fell in 1910. From 1910 to 1920 various workers (Marine and Lenhart, Chvostek, Marcel Labbé, Neisser, Neisser and Loewy, Zondek) reinvestigated the question, and showed by the records of some of their clinical observations that great benefit could be derived from the use of iodine in true exophthalmic goitre. Plummer, in 1923, published statistics of 400 cases, definitely establishing the value of iodine in the acute crises of exophthalmic goitre, and its value in the prevention of post-operative accidents. These facts were confirmed by numerous authors (Biedl and Redisch, Boothby, Fraser, Jackson, Mason, Mayo and Boothby, Means and his co-workers, Merke, Read, J. Slosse, Sturgie, &c.) The American workers, however, made two reservations; while all of them agreed in extolling the use of iodine in true exophthalmic goitre, they admitted its bad influence in patients with thyreotoxic adenoma, which the work of Plummer, as is known, had identified with the condition described by Kocher as Iod-Basedow.[1] If, according to the general opinion, iodine had an unusually rapid and efficacious action in exophthalmic goitre, the action was described as being essentially transient. It ceased, according to the majority of workers, immediately upon the stoppage of the drug. A second course of iodine could not have the same effect as the first, and certainly a third was, for the greater part, ineffective. In short, the action of iodine would stop if it were given continuously in the same dose as the initial one.

Favourable Results of Iodine Therapy in Thyreotoxic Adenoma.

Recent research by Dautrebande and Lemort[2] calls in question the two conclusions propounded by most of the writers previously quoted, concerning the nefarious influence of iodine in toxic adenoma and the shortness of duration of the therapeutic action of this drug. Dautrebande and Lemort have endeavoured to prove, by means of repeated examination of metabolism, whether iodine acts specifically on Basedow's syndrome only, or if favourable results can also be obtained in simple thyreotoxic adenoma. Their examinations were very numerous—ranging between 18 and 60 determinations of metabolism on each patient with toxic adenoma, and their conclusions are definite. They find that (in doses which will presently be stated) the administration of iodine has never produced an increase of the basal metabolism or of the symptoms as compared with their initial state, but has, on the contrary, the same beneficial action as in cases exhibiting Basedow's syndrome. This opinion was contrary to the conclusions of the Americans. Although we were alone in enunciating it at the time (Marcel Labbé has since supported our view[3]) in the face of the clearness of our results we could not but take our stand.

Boothby, the principal supporter of the opposite theory, writes: "Iodine administered to a case of toxic adenoma is fatal after ten days." The first thought of the reader confronted with the two theories is to ascribe to geographical differences the varying manner in which toxic adenomata react to iodine. Moreover, the condition known as Iod-Basedow still exists in Switzerland, and de Quervain avers that one daily comes in contact there with cases of goitre manifesting an individual intolerance to the drug however administered and in whatever dose above ½ mg. per diem—an intolerance which may induce the most advanced degree of cachexia if one fails to recognise its cause.[4] In the face of these contradictory conclusions, and before expressing a definite opinion, it will obviously be necessary to compare results obtained in countries where endemic goitre exists with the facts observed in flat countries. Be that as it may, the mere fact that iodine has a favourable action in Belgium in cases of thyreotoxic adenoma which are clinically identical with the toxic adenomata described by Plummer calls for reconsideration of one of the principal conclusions drawn from the American findings. The demonstration of the activity of iodine in the hyperthyroidism of toxic adenoma in which the thyroxin is, according to Plummer, normal, certainly weakens the most widely accepted explanation of the action of iodine in cases of Graves's disease—viz., that iodine re-establishes the normal iodine-saturation of the thyroxin, supposed to be desaturated in this affection.

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[1] For the classification of goitres see Lucien Dautrebande, La Presse Médicale, Jan. 22nd, 1927.

[2] Bull. de l'Acad. de Méd. de Belgique, meeting Dec. 17th, 1927, p. 887–922. (A complete bibliography on the question will there be found.)

[3] Bull. de la Soc. des Hôp. de Paris, July, 1928.

[4] In the Schweiz. Med. Woch., 1928, No. 1, will be found the most recent statistics on *Iod-Basedow in Switzerland*, reported by W. Fluck, and based on the most extended findings published to date.

The Duration of Action of Iodine.

The second general conclusion which seems to us to require amendment is that of the shortness of duration of the action of iodine. Up to the present iodine has been considered as a medicament with a momentary potent action which, employed up to the time of surgical interference, reduces considerably the operative mortality-rate in cases of Graves's disease to the very lowest figure (Mayo and Boothby: 0·96 per cent.), but is of no use as a fundamental treatment. Lemort and I have found that, by modifying the mode of administration of the drug, it is possible to get prolonged effects from the use of Lugol's solution.[5] The outstanding point in our technique is that we give iodine in continuous progressive doses. For a few days the patient is given 10 to 20 drops of Lugol's iodine daily, and as soon as the general condition has improved and the basal metabolism has fallen, we keep the patient under the initial dose of iodine, avoiding interruption in treatment (no matter of how short duration) as far as possible. The continued use of iodine, on the whole, has only a transitory result if one continues with the initial dose; in order, therefore, to keep the body exchanges and the clinical signs of hyperthyroidism at their minimum, we augment the dose of iodine each time the basal metabolism rises. By means of this technique we obtain a fall in the basal metabolism at each augmentation of the dose in 76 per cent. of cases of true exophthalmic goitre, and in 79 per cent. of cases of thyreotoxic adenoma. It therefore seems difficult to admit that iodine administered over a prolonged period encourages hyperthyroidism. We take the basal metabolism as an index of the amelioration of the disease, because of the objectivity of this biological method. All the clinical signs improved concurrently with the metabolism in cases of Graves's disease, and with a delay of some weeks in thyreotoxic adenoma.

Our method has this considerable advantage over the American method of a single dose administered during the few days before operation: by maintaining the metabolism at a minimum for a long time the patient is able to put on weight, and the operation can be carried out under the best possible physical conditions. All our patients have submitted to long preparation for operation (in some cases three to four months) and some were not operated on until they had put on 6, 7, 8, or 10 kg., and until the cardiac rhythm had become stabilised over a long period. Further, some of our patients maintained a minimum metabolism over a very long period with very small doses which is a great advantage for cases of hyperthyroidism who fear operation or who wish to put it off. (We have under observation patients who will presently have been treated by iodine for as long as three years, in the hope that it will not be necessary to operate.) On the other hand, this progressive method of dosage has enabled us, up to the present, to check the effects of prolonged hyperthyroid crises, some of which appeared alarming. Perhaps this treatment will go towards furthering the results obtainable from radiotherapy.

New Method of Administration of Iodine.

The method of administration of iodine seems to be important. As soon as the dose exceeds 20 drops a day, it is well to divide it into two, three, or four doses daily. As a matter of fact, iodine is eliminated with great rapidity (50 per cent. being found in the urine 12 hours after ingestion (Potel)). At present I am more and more inclined towards splitting the doses into fractions, and the two cases reported below show that that technique gives interesting results, and allows of a fall in metabolism in cases where simply increasing the dose has not been efficacious. The first case was a patient with true exophthalmic goitre, and the second a typical case of toxic adenoma.

CASE 1.—A single woman of 24 showed no hereditary tendency. In her previous history the only thing of note was frequent sore-throat. Her present illness had started without known cause two years previously. At the onset she noticed constant general lassitude, tremulousness, palpitation, headaches, and loss of weight. At the beginning of 1928 she was for a short time in hospital where a diagnosis of exophthalmic goitre was made and she was subjected to ten treatments by radiotherapy. For four months she had not menstruated. When admitted, on July 12th, 1928, to the care of Prof. Nolf, the classic signs of exophthalmic goitre were striking: marked exophthalmos with glittering eyes and fixed stare; extremely marked tremor of the hands, forearms, and eyelids; profuse sweating, and constant tachycardia with reduplication of the second heart sound. The arterial tension was 10/7 with an oscillometric index of 1½; œdema of the ankles was present, and there was persistent diarrhœa (four to five stools daily for several weeks). Attention has previously been drawn to the frequency of pharyngitis (in my first paper, loc. cit.) which is seldom absent in our country, whereas in America it is scarcely ever found. It was present in this patient with extreme and diffuse redness of the soft palate and the back of the throat. The thyroid was markedly enlarged on both sides, being of a hard elastic consistency. Its surface, though not completely uniform, did not present any clearly defined nodules, and over the entire extent of the thyroid a blowing murmur and a thrill were present. The most outstanding feature was extreme nervousness, which indeed was so uncontrollable that it was impossible to do a determination of the basal metabolic rate.

On July 15th, 1928, three 10-drop doses of Lugol's iodine were commenced daily, and on the 18th three 15-drop doses. On the 24th she was given three 25-drop doses, but the hoped-for improvement did not take place. On the 30th, after a day or two of relative quiet, we succeeded in doing two determinations of the basal metabolism at an hour's interval, the results being +76 per cent. and +84 per cent. From August 1st three 30-drop doses per day were administered, and from the 3rd three 35-drop doses. The nervousness was still as great, and the diarrhœa had not diminished. Nevertheless, the blood pressure improved, being 14/9 and the oscillometric index 2½. The metabolism was hardly altered; it was +68 per cent. on August 8th and +78 per cent. on the 11th after three 45-drop doses per day since the 9th. On the 21st it was still +75 per cent. On the 21st and 22nd ten 10-drop doses were administered throughout the day. On the 23rd the basal metabolism was +40 per cent. The nervousness was unquestionably diminished, although the pulse remained at 123. After determining the metabolism, 20 5-drop doses of Lugol's solution per day were ordered but, as the result of an error in nursing, the patient was only given two 10-drop doses on the 23rd, and four 10-drop doses and one 30-drop dose on the 24th. The metabolism on the 25th was +65 per cent. From that day the patient, who was becoming less and less nervous and in whom there was a distinct subjective improvement (she was having at the most two stools per day), apportioned out her own doses of iodine, taking 5 drops 20 times a day at half-hourly intervals. From that time onward improvement was established. Examination on the 27th showed that the exophthalmos had practically disappeared; the tremor was almost imperceptible, the patient was very much calmer, and she had put on 7 kg. in weight since admission. The metabolism on August 28th was +35 per cent., and on Sept. 3rd it was +37 per cent. in spite of a temperature of 99·3° F. This patient was operated on on the 6th (thyroidectomy as complete as possible being performed; 50 g. of thyroid being removed from the right side, and 30 g. from the left side). On the day of operation 3 ampoules of a special preparation of iodine were injected[6]; then from Sept. 7th ten 6-drop doses were given. After operation she ran a normal course. On the 10th she had menstruated. From the 14th she was given five 6-drop doses. The basal metabolism was again +32 per cent. on the 20th, and from that day iodine administration was stopped. On Oct. 10th the metabolism was +60 per cent., and on the 30th it was +62 per cent.

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[5] We used a solution containing iodine 10 and potassium iodide 20, to 100 of water.

[6] In the first days following operation it is preferable to give iodine in the form of intramuscular injection. Most patients operated on for goitre, as a matter of fact, tolerate iodine by the mouth poorly. Sometimes iodine administered in milk is tolerated better.

CASE 2.—A married woman, aged 40, was seen for the first time on March 20th, 1928. She had no hereditary tendency, and childhood and puberty had been normal. She had married when aged 22, and had her first child when 24. She noticed that after this confinement she suffered from general weakness for two or three years. Three years before coming under our observation she had rapidly lost weight to the extent of 10 kg. in a few months without apparent reason. The menopause came on a year before the time of observation, the patient at that time having twice had a complete month of meteorrhagia within four months. Gynæcological examination at that time revealed only a few small fibroids, which rapidly disappeared. About three months before observation the patient had suddenly felt considerably more nervous; in a few days sleep disappeared, and on Jan. 30th diarrhœa started and was still present (nine or ten stools daily). At the same time she noticed that her skin was becoming livid. She had lost 3 kg. in weight in the last three months.

On examination she presented a striking example of characteristic thyreotoxic adenoma. Her colour was pale and dull, the thyroid was small and uniformly studded over *with little hard nodules; no blowing murmur or thrill* and no carotid pulsation were present. The pulse-rate was 128, and the pulse was regular in rhythm but not in force. The arterial pressure was 14/6·5, and the oscillometric index 3. The hæmoglobin was only 70 per cent., but no abnormal blood-cells were present. In the upright position trembling was barely perceptible. The patient was, nevertheless, highly nervous, a nervousness peculiar to cases of toxic adenoma, which has been called by me *agitation inquiète*. The metabolism was +41 per cent.

From March 21st she took two 10-drop doses of Lugol's solution. Subjective improvement took place immediately, the patient sleeping better, and feeling less nervous. The metabolism on April 21st was +24 per cent. Iodine was now augmented to two 25-drop doses per day. The metabolism on May 4th was +20 per cent., even though the patient was more nervous and though the pulse-rate, which had been 102, had now risen to 110. Nervousness increased during the following days, in spite of the administration of three 15-drop doses per day, and on the 21st the patient's metabolism was +67 per cent. From that date the dose was split up into 13 3-drop doses per day. Improvement was rapid, all the subjective symptoms diminishing; diarrhœa disappeared; the skin regained its usual appearance, and there was no longer *agitation inquiète*. The thyroid diminished to the extent of becoming impalpable. On June 2nd the basal metabolism was −30 per cent., and on the 5th +10 per cent. She had put on 3 kg. in weight from the beginning of observation, even though all the treatment had been ambulatory.

Operation was performed on June 7th (subtotal thyroidectomy). The patient continued to take thyroid up to the 23rd and then stopped all medication. On the 26th all symptoms had disappeared and the basal metabolism was −42 per cent.; on the 28th it was −23 per cent. In November she had put on 10 kg. in weight and her basal metabolism was −34 per cent.

This method of small doses of iodine, frequently repeated, is obviously difficult to apply in hospital. It is not wise save in exceptional cases to entrust its application to a nurse; it is always preferable, if one is dealing with careful patients, to leave to them the work of fractioning-out the doses. Applied with scrupulous exactitude, this method renders a real service to the surgeon who wishes to operate with the minimum of danger, and to the physician who has to combat an acute hyperthyroid crisis. Even though certain goitres are obstinate to all treatment, it will be advisable to try this technique in cases of exophthalmic goitre or thyreotoxic adenoma which have not reacted, or have ceased to react to the single continued progressive dose.

Conclusions.

1. In Belgium cases of thyreotoxic adenoma react to iodine in the same manner as cases of true exophthalmic goitre.

2. The administration of continued progressive doses of iodine, in a certain number of cases, allows the basal metabolism to be maintained at a minimum over a prolonged period.

3. Fractioning of the doses of iodine has been found to be efficacious in cases obstinate to treatment by progressive doses.

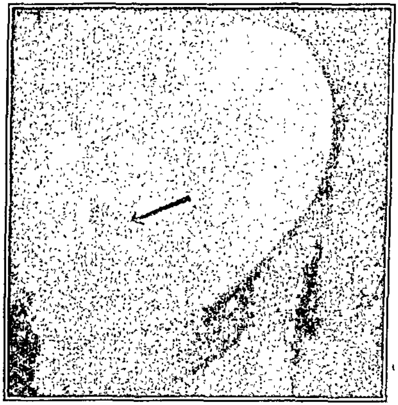
Clinical and Laboratory Notes.

A NOTE ON THE
PREOPERATIVE DIAGNOSIS OF DERMOID CYST OF THE OVARY.

BY ROBERT MAILER, M.D. EDIN., M.S. MINN., F.R.C.S. EDIN.,
HONORARY ASSISTANT SURGEON, VICTORIA INFIRMARY, GLASGOW.

ONLY very rarely is a dermoid cyst of the ovary definitely diagnosed before operation. Sometimes it is considered in the differential diagnosis of a swelling in the pelvis, but in the great majority of cases where a dermoid cyst has been revealed at operation the preoperative diagnosis has been uterine fibroid, simple ovarian cyst, or simply pelvic tumour. Marshall,[1] of the Mayo Foundation, reporting on a series of 415 cases of dermoid cyst of the ovary operated on at the Mayo Clinic up to the end of 1927, states that in no single case was the diagnosis made before operation, though since that time one or two cases have been recognised. In view of these facts the following case may be of interest.

The patient was a young unmarried woman of 20 under the care of Mr. R. B. Carslaw. She had complained of intermittent pain in the left lumbar region and in the left iliac fossa for ten years. Three years earlier she had had an attack of more severe left-sided pain resembling renal colic, and since that time she had suffered from menstrual irregularity and considerable premenstrual pain. Physical examination showed some tenderness in both iliac fossæ. Rectal examination was negative. An X ray photograph, taken to exclude calculus in the genito-urinary tract, revealed three small shadows on the left side of the pelvis apparently outside the bladder area. Their radial grouping, size, and shape did not suggest any relationship to the left ureter, and they bore a fair resemblance to the shadows of teeth. As the shadows overlay gas-filled bowel, a second photograph was taken after further bowel preparation, but the shadows remained constant. An unequivocal diagnosis was made of dermoid cyst of the left ovary containing three teeth. At operation (Mr. Carslaw) the diagnosis was confirmed, and a dermoid cyst the size of a tangerine orange, containing hair, sebaceous material, and three teeth was removed.



Radiogram showing the shadows above the brim of the pelvis.

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[1] Marshall, J. M.: Proc. Staff Meetings, Mayo Clinic, 1928, iii., 4.

somewhat thin. The mitral valve showed patches of atheroma on the flaps and was relatively incompetent. The tricuspid valve was normal. The aortic valve cusps were somewhat thickened. The pulmonary valve was normal. The aorta showed extensive nodular atheroma throughout its whole length, but no rupture was found. The coronary orifices were surrounded by atheroma, but were nowhere obstructed; their lumen was rather wide, and there was marked atheroma of all the arteries. The pleural sacs had no adhesions or free fluid. The lungs were congested and collapsed at both bases. The liver and spleen showed marked cardiac congestion, but the pancreas was normal. The kidneys were somewhat swollen and fatty. In the intestines were numerous diverticula the size of peas distributed throughout the descending colon, sigmoid, and rectum.

It is interesting to try to picture the course of the lesion according to the symptoms displayed at various stages of the history—i.e., (1) originally, (2) early the next morning, (3) at noon, (4) on arrival at hospital, and (5) during the next night. It is also puzzling, in view of the autopsy notes, without any signs of infarct, to account for rupture of the auricle, especially without any exertion. The symptoms were never distressing enough to be diagnosed as anginal, and no one who saw the patient (including a cardiologist of repute) was able to get nearer the diagnosis than "cardiac." Probably the earlier symptoms were vagal, though the sudden ending and the absence of signs of hæmorrhage before it would seem to contra-indicate the probability of early leakage.

London, S.W.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

TREATMENT BY COLLOID METALS.

AT a meeting of the Section of Tropical Diseases (to which members of two other sections had been invited), held on April 18th, Dr. J. B. CHRISTOPHERSON being in the chair, Sir LEONARD ROGERS communicated a paper by Prof. A. PALDROCK, of Tartu, dealing with his observations upon

Leprosy in Estonia and its Treatment by CO_2 Snow and Solganal.

The isolation of lepers, he said, still had its adherents, and at the present day it was compulsory in Estonia, but he doubted its utility, and thought it must yield to more humane methods. In the beginning of 1928 Estonia had 235 registered lepers, the numbers having remained fairly constant of late years. Of 236 cases in 1926, 127 were of the tuberose form, 26 of the macular, 36 of the anæsthetic, and 21 each of the tubercular anæsthetic and the macular anæsthetic. Most of the victims were agricultural labourers. The source of infection was traced to the mother 19 times, father 13 times, sisters 17 times, other relatives 20 times, and was unknown in 149 cases. The leprosy germs were situated chiefly in the lymph spaces; they consisted of several granules surrounded by a protective envelope, the whole being probably evident as a rod-shaped appearance. These granules generated other granules, and they in turn became centres of reproduction. From the rod-shaped fragments buds were seen to burst, and on the ends of the fragments were umbels. He considered that the germ of leprosy was not a bacillus, but a trichomyces or thread fungus. The granules were found to contain free nucleic acid, and in the envelope nucleo-proteins were present. Free lipoid was found chiefly in the envelope, lipoproteins being principally in the granules where the lipoid-albumin compounds were combined with a Gram-positive and with a Gram-negative lipoid acid.

Prof. Paldrock compared the micro-chemical behaviour of leprosy germs with that of tubercle bacilli. He had been able to show that lepers had free complement in their blood; the quantity of complement indeed might be greater than that of normal serum. This was all to the good in CO_2 treatment, which was accompanied by a measurable consumption of complement. If a leproma was congealed by CO_2 snow at minus 73° C. changes were thereby produced in colloid equilibrium; there was a movement of albuminoid to globulin, and thence on to fibrinogen. After freezing there was a change to plasma stability as manifested by an accelerated sedimentation velocity of the erythrocytes, an acceleration which was demonstrable for 14 days after the application of snow. Congealing at one sitting five to ten sites on a healthy skinned person with a CO_2 rod 5 mm. in thickness—as was done in leprosy treatment—was followed by considerable shock, in which there was a sudden drop in the leucocyte count. In lepers the extent of this drop depended on the duration of the disease. During the course of the treatment with the snow there was a continual increase in the leucocytes. The released products of the leproma became absorbed and distributed through the body, causing a resolution of uncongealed lepromata as a distant effect. Thus CO_2 snow was a means of active auto-immunisation, and the remedy was regarded as specific.

The application of local cold should, said Prof. Paldrock, be limited to the time necessary for provoking a disturbance of equilibrium in the leproma. It sufficed to press a CO_2 rod 5 mm. thick on a leproma of small diameter for three to four seconds. More than a fortnight was needed for the shock of the cold to work itself out; hence the application should be repeated in three to four weeks' time. Only five to ten lepromata should be treated at a single sitting; otherwise the degree of protein shock would be too great. Patients freed of their leprous symptoms could not be regarded as finally cured; in four-fifths of the cases there was, two years later, the recurrence of trunk lepromata of minute size; but these disappeared more quickly than the original lesions after a single application of the snow. Having been deprived of their envelope the granules became susceptible to the action of such chemotherapeutic remedies as had an affinity with the substances in the granules. Such a remedy was solganal, which contained 36·5 per cent. of gold. By means of this preparation the Gram-positive leprosy germs of the body were transformed into Gram-negative ones; it also exerted a specific effect on the leprosy germs. Ten per cent. solutions of solganal, up to a total of 11 to 13 g., were borne without trouble. A sign of the weakening of the germs was the fact that they gradually lost their acid-fastness.

If after two years of CO_2 treatment a tolerance for cold had been established, a new and different shock must be brought into use, and for this purpose solganal was appropriate, as it provoked the mobilisation of fresh protective forces against the already weakened micro-organism. It completed the work already begun by the snow.

Sir LEONARD ROGERS also read a communication by Dr. F. G. ROSE on a new method of obviating blockage of the veins in the

Intravenous Administration of Sodium Hydnocarpate

in leprosy. The method consisted in exposing the sodium hydnocarpate to the radiations of a mercury-vapour lamp. After this had been done the substance could be injected into smaller veins, and there was an absence of local irritation. If a small vein was chosen from the beginning the same vein could be used for the injections repeatedly, without causing any difficulty. Even small children tolerated the 3 per cent. solution. The radiation changed the colour of the solution from a light to a darker shade of yellow. To ascertain whether the radiation affected the activity of the drug controls were employed. Œdema of hands and forearms which somtimes followed the injections could be readily cleared away by applying evaporating lead lotion.

Dr. R. A. **HENDRY** said it did not yet seem clear that metals such as gold, mercury, and copper, in various forms, had a definite specific effect in the treatment of leprosy and tuberculosis. Of recent years attention had been chiefly centred on gold. Gold differed from most of the metals which had come into use as a result of chemotherapeutic work from the fact that it could not be combined directly with carbon; attempts had been made to combine gold with carbon through the intermediation of sulphur. He agreed that under the influence of CO_2 snow the metals might have a different action, but so far the results on the whole were disappointing.

Dermatological Experience.

Dr. **HALDIN DAVIS** said he had used certain gold compounds in lupus erythematosus, and to a limited extent in psoriasis. In 1913 Brook and Gluck used gold for lupus vulgaris, as a result of which they reported striking improvement, but not cure. Crysolgan was then largely used. In vitro it was found in a strength of one part in a million to restrain the growth of tubercle bacilli. In a series of 43 cases treated in this way 28 were cured, 6 were improved, 4 were in a stationary condition, 4 became worse. He thought these four had received an overdose. The drug which, in his experience, had been most useful in lupus erythematosus was sanocrysin, a combination of gold and thiosulphite. Lupus erythematosus seemed to him to have many affinities with tuberculosis, though it was still undecided whether it was a tuberculous manifestation or not. For the disease he was referring to, sanocrysin was, in his experience, more valuable than crysolgan. With regard to toxicity, 35 mg. of sanocrysin per kilo of body-weight was well borne by animals, so that a safe amount for a man of 120 lb. weight would be 2000 mg. Crysolgan was about half as toxic as sanocrysin. There were objections to the use of these drugs. After sanocrysin skin rashes were common, and after a small dose he had seen a pruritic rash on the arms and legs. These manifestations, however, were usually evanescent, and left no serious trouble. Stomatitis or ulceration of the tongue might occur. Dr. Drake had reported the occurrence of pustular eruptions in the scalp in a patient who was having sanocrysin for phthisis. The speaker had seen a case which after sanocrysin developed exfoliative dermatitis, causing the patient to be ill for a month. At the end of that time when the skin had recovered the lupus erythematosus was found to have disappeared entirely. The condition had lasted 16 years, and the patient had lost all her hair. Recently there had been a slight relapse, but a good new growth of hair persisted. In psoriasis the story of colloid metals was much the same as that of other drugs—namely, very unequal results.

Gold Salts in Tuberculosis.

Dr. F. G. **CHANDLER** spoke of the use of gold salts in the treatment of tuberculosis. In the last three or four years he had treated with sanocrysin 50 to 60 cases of pulmonary tuberculosis. At first large doses were given and severe reactions followed. At a later period he started with 0·1 g., increased to 0·25, 0·5, 0·75, and finally 1·0 g., until nine grammes had been given. He could not speak confidently about the therapeutic value of the drug, but he believed in its efficacy, and intended to persevere with it. After its use albuminuria was almost a constant feature, though, if slight, this might be practically ignored; but it was essential to examine the urine microscopically after each injection. If blood cells or casts were found the treatment was suspended until the urine became clear. Sometimes diarrhœa occurred, but it was ephemeral, and could usually be ignored. At the first sign of skin disease he stopped the drug and did not care to resume it. Vomiting might occur. Pain and sloughing might take place at the site of inoculation if any of the material were allowed to get outside the vein. He thought sufficient had been achieved to warrant a further exploitation of gold as a therapeutic agent in such diseases as leprosy and tuberculosis.

Dr. J. M. H. **MACLEOD** said that in his hospital department sanocrysin had been used a good deal, but he did not yet feel able to speak definitely as to results. He agreed, however, that better results had been obtained with sanocrysin than with crysolgan. Of 15 cases of lupus erythematosus under treatment a few had shown signs of improvement; in others the result so far was doubtful. He did not think there was any real connexion between this disease and tubercle; in many cases lupus erythematosus was associated causally with some septic focus. Some acute cases had reacted to the new B. W. & Co. antiscarlatinal vaccine. Probably a streptococcus was at the bottom of the trouble. No drug was yet known to have a specific effect on the tubercle bacillus, and he did not know of one which acted specifically and directly on the leprosy bacillus. With regard to freezing by CO_2 he spoke of his pioneer work with this method, and remarked that a three-second contact with a leprous lesion, under whatever pressure, did not seem likely to cause much result. If the organism responsible for leprosy were a streptothrix he did not understand the difficulty everybody experienced when trying to grow it. He thought the effect of irradiation on a colloid metal would be to render it inert.

Reply.

Sir **LEONARD ROGERS** said he had no personal experience of CO_2 in leprosy, but any method which would distribute a certain number of leprosy bacilli and set free antigens would produce some degree of immunity. The dose must be so regulated that no severe reactions followed, but it was only in certain early cases that the improvement went on long enough to clear the bacilli out. The method described by Prof. Paldrock was based, he thought, on the right principle. In some cases a simpler but efficacious method was to apply 25 per cent. trichlor-acetic acid. 5000 new cases of leprosy were now under treatment in various parts of the world, chiefly in Africa, and patients were returning week after week for their injections as they themselves believed in it.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

AT a meeting of this Society, held on April 19th, the chair was taken by Dr. J. **HOWARD-JONES**, the President, and a discussion on

BIRTH CONTROL

was opened by the Rev. **GRIFFITH JONES**. He spoke of the change of attitude towards this subject and of the falling birth-rate. In 50 years the birth-rate had decreased by more than half, and ours was now the lowest in Europe; within five years, at this progress, the birth-rate and death-rate would be equal. Man was on this planet, he thought, primarily to live his individual life to the highest possible extent and value for himself, and, secondly, to increase and improve his race by begetting healthy offspring. To these ends he was supplied with imperative instincts. Mr. Griffith Jones insisted that the "family instincts" were a set of organic instincts interlocked and combined into a group which was intended to remain a group and not to be separated into the components. The natural unit of society was the father-mother-and-child and not the husband-and-wife. Mankind was not endowed with sex propensities for their own sakes but purely as a means to an end, the production of offspring. Were it not for sex there would be no qualitative improvement at all, no upward movement from the amœba to man. Nearly all the beauty of nature was derived from some form of sexual attraction. For the perfect family relationship—so that every boy and every girl somewhat thin. The mitral valve showed patches of atheroma on the flaps and was relatively incompetent. The tricuspid valve was normal. The aortic valve cusps were somewhat thickened. The pulmonary valve was normal. The aorta showed extensive nodular atheroma throughout its whole length, but no rupture was found. The coronary orifices were surrounded by atheroma, but were nowhere obstructed; their lumen was rather wide, and there was marked atheroma of all the arteries. The pleural sacs had no adhesions or free fluid. The lungs were congested and collapsed at both bases. The liver and spleen showed marked cardiac congestion, but the pancreas was normal. The kidneys were somewhat swollen and fatty. In the intestines were numerous diverticula the size of peas distributed throughout the descending colon, sigmoid, and rectum.

It is interesting to try to picture the course of the lesion according to the symptoms displayed at various stages of the history—i.e., (1) originally, (2) early the next morning, (3) at noon, (4) on arrival at hospital, and (5) during the next night. It is also puzzling, in view of the autopsy notes, without any signs of infarct, to account for rupture of the auricle, especially without any exertion. The symptoms were never distressing enough to be diagnosed as anginal, and no one who saw the patient (including a cardiologist of repute) was able to get nearer the diagnosis than "cardiac." Probably the earlier symptoms were vagal, though the sudden ending and the absence of signs of hæmorrhage before it would seem to contra-indicate the probability of early leakage.

London, S.W.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

TREATMENT BY COLLOID METALS.

AT a meeting of the Section of Tropical Diseases (to which members of two other sections had been invited), held on April 18th, Dr. J. B. CHRISTOPHERSON being in the chair, Sir LEONARD ROGERS communicated a paper by Prof. A. PALDROCK, of Tartu, dealing with his observations upon

Leprosy in Estonia and its Treatment by CO_2 Snow and Solganal.

The isolation of lepers, he said, still had its adherents, and at the present day it was compulsory in Estonia, but he doubted its utility, and thought it must yield to more humane methods. In the beginning of 1928 Estonia had 235 registered lepers, the numbers having remained fairly constant of late years. Of 236 cases in 1926, 127 were of the tuberose form, 26 of the macular, 36 of the anæsthetic, and 21 each of the tubercular anæsthetic and the macular anæsthetic. Most of the victims were agricultural labourers. The source of infection was traced to the mother 19 times, father 13 times, sisters 17 times, other relatives 20 times, and was unknown in 149 cases. The leprosy germs were situated chiefly in the lymph spaces; they consisted of several granules surrounded by a protective envelope, the whole being probably evident as a rod-shaped appearance. These granules generated other granules, and they in turn became centres of reproduction. From the rod-shaped fragments buds were seen to burst, and on the ends of the fragments were umbels. He considered that the germ of leprosy was not a bacillus, but a trichomyces or thread fungus. The granules were found to contain free nucleic acid, and in the envelope nucleo-proteins were present. Free lipoid was found chiefly in the envelope, lipoproteins being principally in the granules where the lipoid-albumin compounds were combined with a Gram-positive and with a Gram-negative lipoid acid.

Prof. Paldrock compared the micro-chemical behaviour of leprosy germs with that of tubercle bacilli. He had been able to show that lepers had free complement in their blood; the quantity of complement indeed might be greater than that of normal serum. This was all to the good in CO_2 treatment, which was accompanied by a measurable consumption of complement. If a leproma was congealed by CO_2 snow at minus 73° C. changes were thereby produced in colloid equilibrium; there was a movement of albuminoid to globulin, and thence on to fibrinogen. After freezing there was a change to plasma stability as manifested by an accelerated sedimentation velocity of the erythrocytes, an acceleration which was demonstrable for 14 days after the application of snow. Congealing at one sitting five to ten sites on a healthy skinned person with a CO_2 rod 5 mm. in thickness—as was done in leprosy treatment—was followed by considerable shock, in which there was a sudden drop in the leucocyte count. In lepers the extent of this drop depended on the duration of the disease. During the course of the treatment with the snow there was a continual increase in the leucocytes. The released products of the leproma became absorbed and distributed through the body, causing a resolution of uncongealed lepromata as a distant effect. Thus CO_2 snow was a means of active auto-immunisation, and the remedy was regarded as specific.

The application of local cold should, said Prof. Paldrock, be limited to the time necessary for provoking a disturbance of equilibrium in the leproma. It sufficed to press a CO_2 rod 5 mm. thick on a leproma of small diameter for three to four seconds. More than a fortnight was needed for the shock of the cold to work itself out; hence the application should be repeated in three to four weeks' time. Only five to ten lepromata should be treated at a single sitting; otherwise the degree of protein shock would be too great. Patients freed of their leprous symptoms could not be regarded as finally cured; in four-fifths of the cases there was, two years later, the recurrence of trunk lepromata of minute size; but these disappeared more quickly than the original lesions after a single application of the snow. Having been deprived of their envelope the granules became susceptible to the action of such chemotherapeutic remedies as had an affinity with the substances in the granules. Such a remedy was solganal, which contained 36·5 per cent. of gold. By means of this preparation the Gram-positive leprosy germs of the body were transformed into Gram-negative ones; it also exerted a specific effect on the leprosy germs. Ten per cent. solutions of solganal, up to a total of 11 to 13 g., were borne without trouble. A sign of the weakening of the germs was the fact that they gradually lost their acid-fastness.

If after two years of CO_2 treatment a tolerance for cold had been established, a new and different shock must be brought into use, and for this purpose solganal was appropriate, as it provoked the mobilisation of fresh protective forces against the already weakened micro-organism. It completed the work already begun by the snow.

Sir LEONARD ROGERS also read a communication by Dr. F. G. ROSE on a new method of obviating blockage of the veins in the

Intravenous Administration of Sodium Hydnocarpate

in leprosy. The method consisted in exposing the sodium hydnocarpate to the radiations of a mercury-vapour lamp. After this had been done the substance could be injected into smaller veins, and there was an absence of local irritation. If a small vein was chosen from the beginning the same vein could be used for the injections repeatedly, without causing any difficulty. Even small children tolerated the 3 per cent. solution. The radiation changed the colour of the solution from a light to a darker shade of yellow. To ascertain whether the radiation affected the activity of the drug controls were employed. Œdema of hands and forearms which somtimes followed the injections could be readily cleared away by applying evaporating lead lotion.

it could be made to fit exactly. The Dumas was used for the very short cervix with lax vaginal walls unable to retain a Dutch cap. The most recent spermaticide was the Parke Davis 2-grain hypodermic tablet of quinine and urea hydrochloride which was placed within the concavity of the cap next the cervix. It was odourless and non-greasy, and the experience of 14 months showed that it was efficient enough to render the douche unnecessary. This was an important improvement on the "cap" method.

The records being accumulated by the clinic were very valuable, and it was hoped before long to be able to give an answer to several vexed questions. In judging results, facility and comfort in use must be considered as well as technical efficiency. Over 1600 patients had attended the clinic. In estimating results none was called "good" unless it was known positively that the method had been used for at least six months with comfort and success by a woman previously fertile. Of the first 50 patients at the clinic 29 showed good results, and among these there were eight failures for the following reasons: neglect to use the pessary (four); pelvic difficulties, neglect to syringe properly, nervousness, and habitual constipation (one each). The average wage among these families was £2–£3 a week. Among the first 100 women fitted with the latest developments, 59 reported good results for at least six months. There was one failure for no discoverable cause, one due to neglect of syringing, one to use of a broken pessary, and five from neglect to use the cap. No woman who subsequently wanted a baby had failed to have one on giving up the use of the contraceptive.

Mrs. HODGSON described a rural clinic experiment she had recently seen in California; the unit included an emergency ward and a room where advice was given on different days on infant welfare, tuberculosis, venereal disease, and therapeutic birth control. Very poor people of low mentality found present methods difficult to learn: it was to be hoped that some simpler way would be found for them.

Mr. GRIFFITH JONES briefly replied.

The PRESIDENT, in proposing a vote of thanks, observed that in his town the death-rate had exceeded the birth-rate during the whole of the first quarter of this year, though the deaths had not been remarkably numerous.

LIVERPOOL MEDICAL INSTITUTION.

At a pathological meeting of this institution on April 11th Mr. C. ALEXANDER WELLS read a paper on

Congenital Anomalies of the Ureter.

After referring briefly to the embryology, he described a series of cases in which he had prepared diagrams of the cystoscopic appearances and lantern slides from radiograms. These cases included five examples of reduplication of the ureter on one side, and he pointed out the importance of recognising this abnormality and of instituting adequate investigation in order to avoid mistakes in diagnosis, such, for instance, as passing an opaque catheter up a healthy ureter, some distance away from the doubtful stone shadow, when a second instrument passed along the second ureter on the same side would demonstrate its true nature. He briefly described the morbid anatomy of the kidney in these cases and, after passing rapidly over congenital cystic kidney, simple and crossed dystopia and unilateral absence of the kidney, spoke on the subjects of congenital dilatation of the ureter and ureterocele. He showed the cystoscopic and radiological findings in the case of a boy of three with enormous dilatation of both ureters, with their pelves and calices, without any demonstrable obstructive lesion—in fact, with widely patent ureteric orifices on both sides, conforming to [illegible] d though rare type. He further submitt[illegible] cases which he said were [illegible] segmental congenital dilatation of certain authors and described, in connexion with them, a reflux up the ureters of the contents of the bladder, synchronous with respiratory movements and indicated by the excursions of a flake of mucus. This sign he suggested was characteristic of a more or less dilated ureter plus a fixed patent orifice, and he said he had noticed it also in tuberculous infection of the ureter. The paper was concluded with two cases of ureterocele or ureteric balloon.

In the discussion which followed, Mr. FRANK JEANS spoke of the pitfalls associated with congenital absence or misplacements of one kidney. Dr. NORMAN CAPON referred to two cases of congenital dilatation of the bladder and ureters described by him some years ago in association with Dr. Fordyce. Mr. R. KENNON doubted the congenital nature of the segmental dilatations, and Mr. J. T. MORRISON referred to the difficulties of diagnosis due to disease complications of anatomical variations and described a case of calculus occurring in a ureterocele.

Reviews and Notices of Books.

PROTOZOOLOGY.

A Manual for Medical Men. By JOHN GORDON THOMSON, M.A., M.B., Ch.B., Director, Department of Protozoology, London School of Hygiene and Tropical Medicine; and ANDREW ROBERTSON, M.B., Ch.B., Lecturer and Milner Research Fellow in the Department of Protozoology. London: Baillière, Tindall and Cox. 1929. With four plates and 220 text-figures. Pp. xvi.+376. 30s.

DURING the past few years a number of books on the medical aspects of protozoology have been published, each having special features. This work occupies a place of its own. It is written expressly for medical men and deals largely but not entirely with those protozoa which are human parasites. Though each organism is fully described the general arrangement of the book is based on the disease-producing powers rather than on the zoological status, the pathology of the infections occupying a prominent place. For these reasons the order in which the parasites are presented to the reader is not that of the systematist, but rather that of the clinician or pathologist, the important malarial parasites occupying first place. However, sufficient attention is given to the allied parasites of animals to enable the student to realise that human beings are not the only hosts afflicted, and that the study of animal infections may at times throw considerable light on those of man.

The book begins with a short introduction which deals with such subjects as the structure of the cell, the methods of multiplication, and the classification of the protozoa. The reader is then introduced to the malarial parasites of man, of which the morphology, differentiation, life-history, transmission, cultivation, and pathology are described in about 60 pages, with a note on immunity and the complication of blackwater fever. There follows a short section on the allied parasites of animals. The account is clear and concise and the student who reads the section carefully will find in it all that he requires to know. It is noteworthy that the authors adopt the view that there are three well-known species in man and regard others which have been described as of doubtful authenticity. Attention is drawn to artefacts in blood films; various objects to be seen under a microscope are illustrated in a coloured plate, so that confusion may be avoided. A short section on coccidiosis includes an account of the notorious coccidia of fish which may be encountered in human fæces and which led to the erroneous assumption that they were human parasites. This is followed by sections [illegible] plasmosis, hæmogregarines, and the [illegible] Seventy pages are devoted to the [illegible] intestinal amœbæ of man, certain [illegible] and coprozoic amœbæ. The pathogenic *Entamœba histolytica* receives the same close attention as is accorded to malarial parasites. Under the heading flagellates are considered those which are parasitic in the intestine of man, the leishmania, and the allied trypanosomes. The section devoted to the intestinal forms is followed by a useful account of the methods of examination of fæces for protozoa and the common objects which may be encountered and may cause errors in diagnosis. As regards the leishmania, the recent work carried out with sand flies and the possibility of transmission of kala-azar and oriental sore by the agency of these flies is fully discussed. The section on the trypanosomes is sufficiently comprehensive and is followed by short accounts of the ciliates and the sarcosporidia. This completes the consideration of the protozoa, but certain intracellular bodies of doubtful nature, such as anaplasma, bartonella, rickettsia, and the undetermined toxoplasms are also described. Spirochætes, though admittedly not protozoa, are carefully and fully dealt with for the convenience of medical men. A section on technique as applied to the study of parasitic protozoa and a glossary of the derivations of certain names and terms complete the volume. The authors have caused Greek words to be written in Roman characters for the benefit of those who are unacquainted with Greek, but it seems to us doubtful if they will appreciate the change.

The work is beautifully got up and illustrated. Students at the London School of Hygiene and Tropical Medicine and similar teaching institutions, for whom the book was primarily written, are fortunate in having presented to them in such an attractive form the important facts of medical protozoology.

SURGERY.

Problems in Surgery. University of Washington Graduate Medical Lectures, 1927. By GEORGE W. CRILE, M.D. Edited by AMY F. ROWLAND. London and Philadelphia: W. B. Saunders Company, Ltd. 1928. Pp. 171. 18*s.*

IN this volume of collected graduate lectures Dr. Crile sets out interesting and original observations on half a dozen subjects. The first lecture on the management of the acute infections expresses orthodox views in a concise and attractive manner and the author's own epigram of "cut and quit" well illustrates his argument. In the lecture on malignant and premalignant conditions the use made in the Cleveland Clinic of Surgery, Radium, and X Rays is well summed up, and valuable statistics of results in the treatment of cancer are given. The third chapter, on operations on the bad-risk patient, contains the fruits of the work of Crile and his associates on shock and allied conditions. The use of diathermy to maintain the body temperature during and after operation is, so far as we are aware, new in this country, and merits trial; but we find it difficult to place as much faith in blood transfusion for bad-risk cases such as are not directly due to hæmorrhage as appears general in America. Of hyperthyroidism Dr. Crile writes with the immense experience of 17,759 operations on the thyroid gland behind him; he stresses the importance of the amount of tissue to be removed. The picture of the extreme case requiring almost total removal of the gland as "a temperamental young married woman, with a faithless husband, a sickly child, insufficient income, quarrelsome relatives, and infected tonsils" makes one admire, but with a tinge of regret, an operative mortality of 0·8 per cent.! The fifth lecture is a diagnostic and operative clinic on the surgery of the gall-bladder, stomach, and breast, and the final one deals with some of Dr. Crile's views on the body as a bipolar electric machine. This last chapter, while full of stimulating speculations and possibilities, takes so much for granted that it fails to be convincing, and we feel that the author will have difficulty in inducing acceptance of his doctrine that life consists fundamentally in the maintenance of a difference in potential. The book is admirably printed and illustrated and will provide many new ideas for the study of the critical reader. It must, however, be read with care because fact is not clearly separated from theory, and we can imagine that with Dr. Crile's personality behind these lectures the graduates who heard them may well have failed among the abundance of wheat to detect any chaff at all.

Surgery in the Tropics. By Sir FRANK POWELL CONNOR, D.S.O., F.R.C.S., D.T.M. & H., Lt.-Col. I.M.S., Professor of Surgery, Medical College of Bengal, Calcutta; and Surgeon to the College Hospital. London: J. and A. Churchill. 1929. Pp. 293. 12*s.* 6*d.*

THE author of this book prophesies that tropical diseases are likely to be distributed more widely now that aerial communication is becoming extensively used. Moreover the depressing effect of residence in a hot climate alters the whole outlook in surgical diseases, and thus arises the need for a book written by a surgeon actively engaged in practice in the tropics. On the whole Sir Frank Connor succeeds well in his attempt to write a supplement to the ordinary surgical text-book, bringing out the special methods found to be more effective under the conditions in which he lives and works. The novice plunged into tropical surgery would welcome rather more explicit directions as to treatment of such diseases as plague, which is dismissed in 16 lines, or Baghdad boil, for which the dose and frequency of administration of antimony tartrate is not given. The author's experience of the efficacy of intravenous iodine injections in septicæmic conditions including plague, and of the success of lymphangioplasty in elephantiasis is of especial interest since this operation has been abandoned in Europe. The management of ileostomy for intractable dysentery should receive fuller notice. The book is of small size and can usefully be added to the equipment of any practitioner proceeding to the tropics.

MATERNITY AND CHILD WELFARE. By ETHEL CASSIE, M.D., Ch.B., D.P.H. Edin. London: H. K. Lewis and Co., Ltd. 1929. Pp. 228. 8*s.* 6*d.*

DR. Cassie sets out to fill an obvious want by supplying health workers in maternity and child welfare with a book between the elementary type suited to voluntary and untrained helpers and the advanced type of little value to those without medical training. She has succeeded very well and has steered a straight course without much deviation to one side or the other. Here and there she has perhaps gone further afield into medical and scientific matters than will be appreciated by the audience she is catering for. Much of the chapter on embryology and related problems, particularly the attempt to discuss maturation and fertilisation of the ovum, transmission of hereditary factors by the chromosomes and Mendelian laws, will be found too condensed to be of any educational value to a health visitor.

The first of the three sections into which the book is divided is mainly taken up with the administrative duties of the health visitor—in the home, at the antenatal and infant clinic, and at special clinics and institutions. A chapter on the health visitor and the midwife may raise some resentment among midwives, for it begins by saying that the health visitor is often required to act as inspector of midwives, and its message appears to be addressed largely to those acting in this capacity. The better trained and experienced midwives are inclined to object to the inspector who has no more knowledge of midwifery than that acquired during training for the C.M.B. certificate. Unless she has had the responsibility and experience of having herself practised as a midwife she can neither appreciate the difficulties under which these workers carry out their duties, nor inspire in them that confidence which they ought to feel in a teacher and adviser.

Section II. is occupied with physiological and hygienic matters—infant feeding, food values, weaning and child management; and Section III. with pathological states—the premature, feeble, and ailing infants, metabolic disorders and infections, together with diseases of special sense organs, throat and nose, and mental deficiency. All of it will be of value to health workers.

Though in this book the matter is clearly set out and the teaching generally is sound, the whole lacks inspiration. Something is wanting to make the dry bones live; possibly it is more of the human side and a little humour. The paragraph headings of "The Hostile Grandmother" and "Interfering Neighbours" raised our hopes, but without justification. It is possible, however, that a lighter touch would not be appreciated by many of those who take their work most seriously, being sensible of its fundamental importance. Dr. Cassie has supplied a text-book which contains an adequate presentation of what a health visitor should know and will doubtless have many and grateful readers.

THE CONSTITUTION OF SUGARS.

By WALTER NORMAN HAYWORTH, D.Sc., Ph.D., F.R.S., Professor of Chemistry in the University of Birmingham. London: Edward Arnold and Co. 1929. Pp. 100. 8*s.* 6*d.*

THE discovery by Emil Fischer of two methyl glucoside derivatives of glucose led to the recognition of the fact that the ordinary open chain aldehyde form of glucose represents an intermediate form between two stereochemical α and β glucoses which had of necessity to possess a cyclic structure. The particular structure selected was that of a five-membered ring composed of four carbon atoms and one oxygen, though the possibility of alternative rings was not excluded. With the preparation by Purdie of the methylated sugars a new mode of investigating the nature of the heterocyclic ring was created, and by this means the St. Andrew's School, largely under the direction of Principal Irvine, did much to elucidate the inter-relationships between the various derivatives; it is, however, the merit of Haworth and his co-workers to have set the coping-stone upon this work by providing unequivocal proof as to the nature of the ring structure concerned. Basing upon these researches the author has suggested a new nomenclature, according to which pentoses and hexoses are to be termed respectively furanoses and pyranoses, in order that their relationship to the heterocyclic compounds furan and pyran shall be indicated in their names. This volume, which incorporates some of the manuscript prepared by the author for a course of lectures delivered at the Universities of Bâle, Zürich, Heidelberg, Neuchâtel, and Mulhouse, sets forth in simple language the brilliant reasoning and ingenious experimentation by means of which the constitutions of the sugars have been deduced. Those who have not had the opportunity of reading the original papers should be grateful to the author for having provided them with this lucid summary of our present knowledge of the constitution, not only of the monosaccharides, but of the di, tri, and polysaccharides as well.

EXPERIMENTELLE NEUROLOGIE.

Physiologie und Pathologie des Nervensystems. By E. A. SPIEGEL, Assistant in the Neurological Institute of the University of Vienna. Part I. With 69 illustrations. Berlin: S. Karger. 1928. Pp. 281. M.24.

DR. Spiegel believes there is a need for a comprehensive text-book dealing with experimental neurology, by which is understood not merely neurophysiology in a general sense but also experimental neuropathology, and he has undertaken to attempt to fill the gap. This first part of his text-book is certainly full of promise; it deals at the outset with general theories of neural function and proceeds to investigate reflectivity. At this point the studies interest the clinician, since reflex changes following different organic conditions are fully described. A second section deals in similar fashion with the vegetative nervous system. In this way the reader is given a précis of the anatomy, physiology, experimental pathology, and pathogenesis of mechanisms whose clinical function he studies in health and disease. A book of this kind is really useful.

LARYNGOLOGY AND NEUROLOGY.

Kehlkopf und Rachen in ihren Beziehungen zu den Erkrankungen des Zentralnervensystems. By Dr. BELA FREYSTADTL, Budapest. Berlin: S. Karger. 1928. Pp. 326.

DR. Freystadtl's monograph covers the field gleaned by the laryngologist on one side and the neurologist on the other. A review of this kind serves a useful purpose in linking up divergent studies; some 200 pages are allotted to a systematic description of the laryngeal features of disease of muscle, peripheral nerves, cord, brain-stem, and cerebrum. This is excellently arranged; much of the information here collected embodies rather out-of-the-way data of which it is helpful to be reminded. The laryngeal semiology of functional conditions such as hysteria, neurasthenia, and occupation neuroses is followed by a final section on laryngeal spasms and involuntary movements of various kinds, inclusive of so-called palatal nystagmus.

A critical perusal of the monograph has not revealed any material omission; it is a model of what such contributions should be, being well illustrated and well documented.

LES ABSCÈS DU POUMON.

By MICHEL LEON-KINDBERG. Paris: Masson et Cie. 1928. Pp. 134. Fr.14.

THIS is one of a series of short volumes dealing with special medical and surgical conditions. The book contains much useful information and it is up to date, although its scope does not allow more than the merest reference to many important matters. The first 94 pages deal with the causation, physical signs, symptoms, diagnosis, and the various types of abscess, and only 30 are devoted to treatment, of which one is given to artificial pneumothorax and less than a page to thoracoplasty. The bibliography extends over ten pages and will be found very useful by those who wish to make a more exhaustive study of the subject. The diagrams are clearly drawn and helpful. There is no index.

BACTERIOLOGY.

A Text-book of Micro-organisms. First edition. By FRED WILBUR TANNER, Professor of Bacteriology and Head of the Department, University of Illinois. New York: John Wiley and Sons, Inc. 1928. Pp. 548. 22*s.* 6*d.*

THIS is an original and courageous book upon bacteriology. Its author has had the vision to discard the trammels of tradition and to write on bacteriology without any systematic description of species, or any account of methods of staining or the preparation of media; one looks in vain for such words as "Agar" and "Gram" in the index, and their absence increases one's interest in examining the book. It is indeed a welcome change from the stereotyped variety of the text-book, and whilst it is quite unsuited to the medical student, may be read with profit by those seeking higher or special qualifications in which a [illegible] knowledge of bacteriology is essential. The medical aspects of the science are scantily dealt with as incidentals, and the main theme upon which the book is constructed is the general biology of micro-organisms with a certain bias towards commercial application. It is written in a jerky, condensed, and didactic fashion, and is consequently not easy to read, but it is a notable contribution for which most teachers of bacteriology will be grateful to the author.

REGIONAL ANÆSTHESIA.

By GASTON LABAT, M.D. Second edition. London and Philadelphia: W. B. Saunders Company, Ltd., 1928. Pp. 1065. 15s.

THIS second edition of a well-known treatise has been extensively revised and somewhat enlarged. It remains one of the best works on the subject in the English language. The author has the gift of clear exposition and is an ardent exponent of local anæsthesia, yet his enthusiasm is tempered by the judgment of experience. The general discussion on the use of regional anæsthesia in Chapter XIV. is especially valuable. Dr. Labat's views of the scope of regional methods coincide with those of most workers, with the notable exception that he seems still to retain a place for paravertebral anæsthesia in abdominal work. Local anæsthetic methods, valuable as they are, must always depend on the selection of suitable patients. A recognition of this fact seems to have crept into this edition, enhancing greatly the value of the author's recommendations. There are many new pictures of great beauty and clearness. Changes are particularly noticeable in the sections on the head, neck, and limbs. There is also a much amplified section on subarachnoid anæsthesia, which has recently appeared in the same form in the new Nelson "Loose Leaf Surgery."

Every surgeon should read this book even though he does not practise the methods of local anæsthesia.

JOURNALS.

JOURNAL OF PATHOLOGY AND BACTERIOLOGY. Vol. XXXII. Pp. 173–348 April, 1929.—The number is dedicated to Sir Frederick Andrewes (of whom an excellent portrait is presented) in celebration of his seventieth birthday on March 31st, 1929.—Further observations on the oxidation by bacteria of compounds of the paraphenylene diamine series, by S. Ellingworth, J. W. McLeod, and J. Gordon (Leeds). Further data on the production of coloured compounds by bacteria by oxidation of paradiamines, some of which are useful in isolation and identification.—Tumour immunity: natural cytotoxins (heterotoxins): protection of cells against homologous antibodies, by T. Lumsden and A. C. Kohn-Speyer (London). The fresh serum of normal animals contains non-specific cytotoxins which destroy the normal tissue cells and the tumour cells of other species. The tissue cells and tumour cells of an animal are protected against damage by homologous cytotoxins, whether pre-existent or experimentally produced.—Immune reactions and cancer, by F. C. Pybus and H. R. Whitehead (Newcastle). No evidence could be obtained of the existence of antibodies common to malignant cells from different animal species.—The effect of certain factors upon the growth of the pneumococcus, by H. D. Wright (London). For full growth the pneumococcus requires nitrogenous substances (which are adequately supplied by ordinary peptone), some fermentable carbohydrate, and some unknown relatively thermolabile substances which are abundant in blood and yeast, and occur in smaller amounts in meat extract, serum, and peptone.—The effect of growing smooth and rough cultures in serum, by J. A. Arkwright and R. M. Pitt (London). Culture media containing serum with somatic agglutinins for a smooth strain of the typhoid bacillus have a strong tendency to convert a smooth culture into the rough form in one or two weeks.—The fate of colloidal iron administered intravenously, by C. J. Polsen (Manchester). The excess of iron is stored mainly in the liver.—The rôle of the reticulo-endothelial system in [illegible]llosis, by S. B. Rybinsky (Kier). Intravital [illegible] with trypan blue of artificially infected mice [illegible] histiocytes accumulate about the worms especially at the poles of the capsule.—Antivaccinial serum, by C. H. Andrewes (London). Generalisation from intradermal or intravenous inoculation can be prevented by an adequate dose of immune serum. Serum which reaches the tissues five minutes before the virus is far more effective than when the virus is five minutes ahead of the serum.—The Schick reaction and circulating antitoxin, by A. T. Glenny and Hilda Waddington (London). Guinea-pigs are Schick-negative if their serum contains at least 1/250" unit of antitoxin per c.cm.—The importance of thermolabile streptococcal toxin with special reference to its cytolytic effect on leucocytes, by H. A. Channon and J. W. McLeod (Leeds). Hæmolytic streptococci, in addition to the well-known very thermostable Dick toxin, produce a thermolabile toxin with a vigorous leucocytolytic action which is probably of more importance than has been supposed.—Two cases of myelomatosis: (1) diffuse plasma celled, (2) with tumour-like masses and visceral lesions, by D. F. Cappell (Glasgow).—An improved medium for the isolation of *C. diphtheriæ:* trypsinised serum tellurite copper sulphate agar, by V. D. Allison and T. H. Ayling (London). Copper sulphate inhibits spreading *proteus* organisms which may be very inconvenient.—Hydatid infestation (*Echinococcus granulosus*) in sheep, oxen, and pigs, with special reference to daughter cyst formation, by N. H. Fairley and R. J. Wright-Smith (Melbourne). *Echinococcus granulosus* is the new name for *Tænia echinococcus*. The authors give a very thorough study of the occurrence and anatomy of its hydatid phase in sheep, pigs, and oxen, and discuss fully the formation of the daughter cysts. They refute the theory that daughter cysts may arise within the cuticle.—A case of malignant hæmangeiomatous endothelioma, by J. Gray (Aberdeen).—A new design of microscope lamp, by C. E. Jenkins (Salford).—The incidence of primary carcinoma of the liver in South India, by P. N. Basu and A. Vasudevan (Madras). The condition is much more frequent than in Western Europe.

Reports and Analytical Records.

ROTHMAN'S RHODESIAN CIGARETTES.

(ROTHMAN'S LTD., 5 AND 5A, PALL MALL, LONDON, S.W.1.)

THESE cigarettes are made of Rhodesian Virginian tobacco. Each cigarette weighed 1·22 g.; approximately 23 cigarettes weigh 1 oz. The paper of each cigarette weighed 0·047 g. On analysis the following results were obtained:—

Moisture	11·50 per cent.
Ash	8·66 „ „
Sand	0·42 „ „
Nicotine	1·00 „ „
Oil	1·60 „ „

These cigarettes are well made, of even texture, and do not irritate the throat when smoked. The low percentage of ash and sand shows that the tobacco is carefully selected and of the Virginian type. The nicotine is distinctly low as also is the oil.

FLORANGE.

(CLEEVES, LTD., CLEEVEDALE PARK, LONDON, S.W.4.)

"Florange" is a fruit syrup with a most refreshing, agreeable, and pleasant flavour of oranges. For use one part is mixed with 4 to 5 parts of water or soda-water. On analysing the syrup the following results were obtained:—

Sugar..	65·9 per cent.
Water	31·2 „ „
Acid (as citric acid) ..	2·18 „ „
Ash	0·05 „ „
Non-sugar extractives, fruit fibre, essential oil, &c. ..	0·67 „ „

These figures show that "Florange" is made of materials of high quality. No preservatives were detected.

E LANCET.

SATURDAY, APRIL 27, 1929.

KING'S CONVALESCENCE.

's message of thanks to his people has
y the welcome news that his convales-
assured, and that no further daily
to his progress will be issued. The
sion has followed with anxious interest
the story of his long illness which began
o, the first formal bulletin being issued
und will join with a special pride in the
of thankfulness that the measures
he KING's treatment have ended so

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FECTIVE USE OF RADIUM.

m Subcommittee, whose report we
st week, stated that the amount of
le *to-day, although greater than it was*
ite inadequate even to cope with the
needs of medical treatment. While
thods have been elaborated for the
ancer by radium in almost every region
ne radium required for the purpose is not
ommon policy exists among the hospitals
Sution or use. The Committee recognises
y years to come research and treatment
e to be intimately associated if progress
de, for our present knowledge is not
to decide whether the gamma radiation,
essential part of radium therapy, is best
se quarters to malignant growths within
whether the future lies rather with
es of penetrating rays applied at a
may be recalled that the first medical
radium therapy were the dermatologists,
radium to the surface of more or less
rowths. The next advance was made by
pathologists, DOMINICI and REGAUD, who
wths by actually inserting the radium.
work began great advances have been
gical radium therapy, and in this country
leveloped on the side of surgical technique
ses it must be said most ingeniously) to
tive neglect of the possibilities of treating
ternal radiation with a large quantity of
viously, there can never be such a thing
y of irradiation of a tumour by the
asertion of tubes, needles, seeds, or any
ources of radiation. Take, for instance,
he usual methods for treating inoperable
the neck of the uterus; the insertion of
Ae cervical canal, along with applicators
o supplement their action, inevitably
regions of possibly invaded tissues
irradiated. A malignant growth of the
hich the glands are already involved
distribution of malignant cells which
geometer to irradiate uniformly by
bes. The problem is still more difficult
f a tumour of the breast with all its
ications. This has not discouraged so
worker as G. L. KEYNES, and his *results are certainly not to be despised.* But when the numerous tracks of growth in such cases are visualised, does it not seem rather much to expect that any implanting of radium tubes can cope satisfactorily with advanced disease?

For these reasons the method of applying gamma rays externally deserves the most careful consideration by those who are to put into effect the recommendations of the Radium Committee's report. In the view of a correspondent (see p. 898) whose experience carries weight, the logical development of our present-day knowledge is the use of large quantities of radium at a distance from the body. Let us suppose that a deep-seated tumour is exposed to the gamma rays from as much as 4 or 5 grammes of radium element, held at a distance of 10–12 cm. from the surface of the body. If the radium is placed in a suitable container the lateral spread of the rays can be prevented to some extent, and an almost cylindrical beam may be pictured entering the surface of the body and diverging only slightly in its passage through the tissues. A slightly conical zone of radiation extends from the incident to the emergent surface, the intensity gradually gettting weaker owing to increased distance and absorption. The question to be considered is this: can deep-seated tumours be adequately treated in thi way, so that the malignant cells get the necessar dose without the skin suffering any serious damag If the answer is in the affirmative, then the principle of selective action requires no further demonstration and a method exists by which patients can avoid operation. Evidence is accumulating from the clinics of Paris, Brussels, and New York that these expectations are not groundless, but there has not y been time for more than preliminary reports on this work. In this country there is no centre where the method is being tried. Individual gifts of radium a rarely big enough to supply the large amount of radium needed for this type of treatment. We trust that the national scheme outlined by the Radium Committee may lead to the formation of one or two centres where the value of the method can be determined.

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PROFESSIONAL HOSPITALS.

WE publish on page 908 a letter above the signature "Forward," which contains the brave notion tha the counter-actions implicit between a State hospita and a voluntary hospital system would disappea under a scheme whereby the medical professior itself would control and manage the institutions a part of the professional machinery—as "their own industry," in the words of the writer. The schem follows on these two assumptions—first, that th arguments against a State service, which have bee from time to time adduced in these columns, hav been found convincing; and, secondly, that the weal places in voluntary hospital administration, a briefly brought forward, are of such a nature tha the medical profession might be well advised graduall to withdraw their support of them. The alternativ is the setting up of a system of hospitals, which fo convenience may be termed "professional hospitals," to be managed by the medical practitioners of eacl area. *At a time when the whole hospital adminis tration of the country may be described as unde public review in the light of recent legislation* "Forward's" communication invites comment.

The first reflection that his proposal evoke is that to a great extent hospitals, whether ir receipt of State subsidy or conducted on the voluntary principle, are at the present moment in respect of their great responsibilities conducted by the medical profession, and recent debates in the House of Lords during the passage of the Local Government Bill have indicated that there is no intention to change this fundamental principle of good management. But further reflection suggests that the proposal underlying our correspondent's letter implies both a yet wider and more intimate connexion between all the practitioners of an area and the hospitals in their immediate neighbourhood, while the erection of further institutions to receive public subsidy is contemplated, not, apparently, so much to meet an admitted shortage throughout the country of bed accommodation as to replace institutions conducted under systems which have been found wanting. It is, of course, out of the question that any immediate move towards the fulfilment of "Forward's" policy should be made, for economy of money, time, and effort alike would forbid such a course, but the scheme is a timely, if exaggerated, reminder of the professional ideals which, more and more, the enlightened public should be, and are becoming, willing to accept. Medical institutions must to-day be so managed that the actual work of general practice is brought into close elation with hospital administration. And this is view which received wide approval when the Interim Report of the Consultative Council on the future position of medical and allied services was published nearly nine years ago.[1] This Report to the Ministry of Health, although made in circumstances which have in many directions altered, ad for its chief message the need for a systematised provision of medical and allied services, to be applicable to a given area, and to be supplied y the medical profession as a whole, the general ctitioner being the first link in a logical chain with the consultant, the specialist, and the medical auxiliary. Thus, in the Report, there will be seen the outline of an organisation which would have much the same general effect as that which is aimed at by "Forward," although time is postulated during which the necessary uniformity and inclusiveness of the proposals may develop. Our correspondent, and the many who we know will be in agreement with his scheme (however previous or revolutionary), must be prepared, we think, to wait while difficulties of detail are overcome, but their views will assist powerfully to bring about the position, desired by all, that the hospitals of each area should become the place in which the organised medical effort of the locality will be concentrated, and from whence its results will be distributed, while the part played by domiciliary medicine will assume its proper and paramount importance.

Reform along the lines emphasised by the Report of the Consultative Council had been projected in tain respects for many years by the British Medical ociation, whose scheme for the establishment of pitals, clinics, and treatment centres for different es has much in common when dealing with institional treatment. The great difference between the professional hospitals" suggested by our correspondent, and the existing institutions, either as they are, or as they may be, lies in the method set out for election to the staffs. "Forward" writes: "Let the country be divided into suitable areas—smaller in towns, larger in the country. The medical practitioners of each area would combine to elect a staff of consulting surgeons, physicians, oculist, aurist, and the rest." The election to the staff is the great problem. The unworkable nature of the proposal thus summarily stated by "Forward" is obvious, and so are the waste and unfairness manifest in any principles which exclude the general practitioner from the staff. Apart from the intensive training of students, he is often the man whose counsel his colleagues would especially value, so that there should be the best opportunities for its supply. These are the large things which "Forward" makes us contemplate in his brief delivery, and the time for their contemplation is now.

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SOLAR DERMATITIS.

THE reaction of the skin to the sun's rays is peculiar to the individual. Some tan easily and others not at all. Red-haired persons, or the descendants of such, are prone to develop freckles, and instead of pigmenting are apt to suffer from a transient erythematous dermatitis, followed by desquamation of the exposed parts. Transient dermatitis may ensue on any skin which is exposed without precaution to a bright hot sun when there has been no gradual acclimatisation. These well-known phenomena vary according to the type of complexion inherited; they may be regarded as a specific response of the skin itself and hardly require further elucidation. There is, however, a group of cases in which the response far transcends any degree met with among the non-pigmenting brunettes. It is not a question of colour in these cases. They may be blonde or dark-skinned; in fact the latter seem to predominate, and it is clear that some other factor than a simple skin reaction is responsible for the irritable rashes which follow exposure, and which may be violent even when the pigment protection appears sufficient. The rashes may be urticarial, papular, or vesicular, or mixed, and exceptionally bullæ may form, which heal slowly and often leave scars. HUTCHINSON, who first classified these "summer eruptions," was alive to the fact of their solar causation, but could not, in the light of the science of his day, offer any satisfactory explanation of the dyscrasia. A clue to the underlying factor was first suspected after the introduction of the hypnotic drug sulphonal, when it was noted that some persons with an idiosyncrasy developed hæmatoporphyrinuria and a papular or vesicobullous eruption, sometimes confined to, or at any rate more marked on, the face and backs of the hands, parts which are exposed to light. If albino mice are injected with a solution of sulphonal and kept in the dark they remain well, but if exposed to sunlight for any length of time they quickly die, often with a copious vesicular eruption. Some cases of congenital hæmatoporphyrinuria are also extremely sensitive to light, and it seems fair to assume the presence of some light-sensitising substance in the circulation of the affected persons. The nature of this substance is by no means clear. The large majority of cases examined have no hæmatoporphyrin in the urine, although some contain an excess of indican and other evidence of intestinal putrefaction. Two cases of which we have seen notes improved after a course of Plombières treatment, supporting the view that i some cases the responsible toxin is generated in th bowel and escapes the censorship of the liver possibly gains direct access to the blood strea the thoracic duct. CRANSTON LOW, whose vi allergy and sensitisation command attention, that other substances besides L can act as the sensitising age that they may be derived from cereals, especially wheat.

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[1] THE LANCET, 1920, i., 1183 et seq.

Our knowledge of the nature of these circulating toxins is much in the same position as in the case of urticaria, in which Sir THOMAS LEWIS has convincingly demonstrated the potency of histamine and histamine-like bodies, injected locally, in producing an eruption clinically indistinguishable from nettle-rash. It is not unlikely that the toxins responsible for urticaria and solar dermatitis may have a close molecular affinity, for a solar rash may be urticarial and nettle-rash may be papular and even vesicular, especially in the child. Present opinion favours the view that there is not one, but a series of protein molecules which possess the faculty of over-sensitising the skin to the normal stimulus of the sun, and until the biochemist succeeds in isolating or elucidating the metabolic origin of these toxins, our therapeutic measures will continue to be empirical. Moreover, responsibility for the reflex has not been fastened on any particular light rays. Last year at the Paris Medical Society[1] VALLERY-RADOT and others showed a sun-sensitive person, who had responded with an urticarial type of eruption for over 20 years. His reaction was strictly proportional to the intensity of the solar exposure; under ordinary conditions an eruption supervened five minutes after exposure, attained its maximum in one minute, and vanished within half an hour. With a carbon-arc (polymétallique) lamp consuming 30 ampères at 50 cm. distance a similar effect was produced in two minutes. A powerful incandescent lamp furnished with a reflector and working at a distance of 40 cm. produced the reaction in nine minutes, but exposure to the mercury-vapour lamp or to infra-red rays was found to be entirely innocuous, and the authors were able to achieve some degree of improvement in the disability by subjecting the patient to progressive doses, first of ultra-violet and later of daylight itself. This experience, if confirmed, would invalidate the view that the ultra-violet rays are more potent than other parts of the spectrum in eliciting an abnormal response. Heat rays seem to play some part in the mechanism of production, and that there may be a group of rays as yet unidentified, between the ultra-violet and red parts of the spectrum, which are more potent in this respect than either.

SMALL-POX: THE FRENCH RESTRICTIONS.

WE published last week some notes upon the present incidence of small-pox at home and abroad, stressing the effect upon the public mind which the possible distribution of nearly 1500 contacts from the *Tuscania* would necessarily have in this country. Details have been given now showing that, in spite of the extraordinarily favourable opportunity offered for the development of a widespread infection in a closed community on shipboard, only some 44 cases (with seven deaths) had occurred as a result of the case originally taken on board in Bombay, a seaman who was disembarked fatally ill from the disease at Marseilles. The whole situation was viewed in France with great apprehension, and, as that country relies for protection against small-pox upon universal compulsory vaccination to which no popular resistance is ever offered, it was logical that the French Government should propose, and in some places should exact, that no passenger from England who was not prepared with evidence of recent vaccination should be admitted to the country. But a conference between the British and French authorities has since been held at which the weakness, as a preventive measure, of the production of vaccination certificates was recognised on both sides, and, after the discussion of four varying proposals, machinery has been evolved under which, while Article 42 of the International Sanitary Convention, 1926, is followed, the British system of surveillance is also to be observed. An announcement from the Southern Railway states that until further notice passengers landing in France and not possessing a vaccination certificate "not less than ten days and not more than five years old" will require to fill up a sanitary passport—a yellow cardboard form to be obtained en route, when they will be kept under observation in France for 14 days if necessary, but passengers merely passing through France will experience no difficulty. Passengers who have been vaccinated within the required period will be given a receipt for their certificate of vaccination and for them no special or "health-passport" will be required. Others will retain part of the yellow form and will have to report themselves to the health office or *mairie* of the locality to which they go, and they will *be unable to leave that locality within 14 days* without notifying the authorities. It will be apparent that such a wide-reaching organisation as this will entail great trouble upon the French administration, for in effect the machinery is set in action against an undifferentiated population which is only employed in Great Britain upon a limited number of persons who have actually been in contact with the disease. But it must be remembered that the attitude of the French, as a properly vaccinated nation, is a perfectly correct one—how correct will be seen from the words of our Paris Correspondent this week. In France reliance is placed upon vaccination to prevent small-pox, and the French statistics prove that their reliance is justified. Their observations indicate that such cases of small-pox as occur are introduced from without, the sources of infection being derived from countries where the regulations for vaccination are less strictly observed. Having this situation in view the first impulse of the French authorities was to ensure that those coming to France should do as France does; but a closer consideration of the circumstances has convinced the French authorities that the compulsory vaccination of all incomers would not compass their objects, and it has now been decided, with infinite trouble to those authorities, that the British system of surveillance should be employed in lieu of compulsory vaccination.

In the meantime it would appear that the measure of the risk run by the British community through the distribution of contacts from the *Tuscania* has been taken. Notifications to local sanitary authorities should ensure the safety of the population, although an occurrence, which we report from Acton, reveals how ignorance may lead individual citizens to withhold from the sanitary authorities the information necessary for the accomplishment of public duties. Of 28 cases reported in England, 7 were from the Metropolis, 6 from Outer London, 7 from the North and 8 from the South; 13 of the Scottish cases occurred in Glasgow, 1 in Aberdeen. The date on which the last London case sickened was April 7th.

DONATIONS AND BEQUESTS.—The third Earl of Durham left £1000 each to the Durham County Hospital and the Gateshead Dispensary.—The first Baron Hollenden left £8000 to charities, including £1000 each to St. Bartholomew's Hospital and St. Mary's Hospital, Plaistow, and £500 to the Seaside Convalescent Home for Children, Birchington, Kent.—Mrs. Eleanor Barrett Palmer, of Mariston House, Newbury, amongst other benefactions, left £500 each to the Helena Nursing Home, Reading; the Hospital for Incurables, Putney; the Royal Berkshire Hospital, and the Children's Cottage Hospital, Cold Ash, Newbury.—Mr. John Henderson, of Glen Tower, Kelvinnore, Glasgow, left £1000 each to the Western Infirmary, Glasgow, and the Royal Infirmary, Glasgow; and £500 each to the Victoria Infirmary, Glasgow, and the Royal Hospital for Sick Children, Glasgow.

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[1] Bull. Soc. Méd. de Paris, July 5th, 1928, pp. 1122–1125.

Annotations.

"Ne quid nimis."

RAIN AS A SOURCE OF POTABLE WATER.

To most town-dwellers the idea of drinking-water from a rain-tank seems to belong to a past age, but country practitioners know well that many districts still find the cost of a piped supply prohibitive. Mr. Thiselton-Dyer has recently reported to the Ministry of Health [1] on an investigation he has made in three rural areas where rain-water is still in use for all domestic purposes. The usual method of storage is a circular underground tank built of brick and cement and fitted with a hinged wooden cover or stone slab with a cast-iron lid. In some districts the water is taken out by means of a pump in the scullery, but in most the only method is a bucket dipped into the tank. The size of the tank varies, but the usual aim is storage for two months' supply on a basis of ten gallons per head per day. In one area the local authority insists on a minimum 500-gallon tank. The new houses that are being built for town people, who know the delights of country life without its difficulties, have smaller tanks than those supplied in old cottages for folk who know all about the difficulties of dependence on rain-water. On the whole there seems no danger of drought, for the dry summer of 1921 has left no tales of graver shortage in these districts than was experienced where people depended on springs or rivers. With an average rainfall more rain seems to fall on the roofs than can be stored in the tanks, and the difficulty that has to be met is the expense of providing bigger tanks. Large supplies could be obtained from the roofs of churches and public buildings, but the expense of fitting them with good gutters and leading the water to large tanks would have to fall on the local authority. The state of existing gutters in cottages and bungalows varies considerably. Some of the tanks are simply fed direct from the neighbouring gutters, others are fed by stoneware pipes from all the gutters of the house. Sometimes there are no arrangements for cleaning the roofs or filtering the water; an old stocking may be tied round the pipe to serve as filter; sometimes domestic filters are used. Such a supply in a dusty village with factories might prove unsatisfactory, but in open country or hamlets the unfiltered roof water seems to give little trouble. In fact, in the districts inspected, there was no evidence of any ill-health from the rain-water supply, although in many cases the underground tank was at a lower level than the cess-pit and leaky cess-pits were observed. Since it has been found essential for the preservation of local amenities that each house should store its own water and not share a tank with neighbours, the water-supply of any household is only in danger of contamination by the excreta of members of that household. It is an interesting speculation whether this gives rise to a familial immunity which lasts until it is upset by the coming of visitors. Some people boil their drinking-water, but this practice is by no means universal. The tanks are cleaned out when they get nearly empty—which may happen once in two years—but not otherwise, as the people fear lest a period of drought catch them with emptied tanks. When the water becomes smelly a small lump of lime is thrown in to " clear " it. Nevertheless the water in most of these tanks looked clean, and there seemed to be no mud at the bottom.

It seems clear, as Mr. Thiselton-Dyer says, that " provided people are accustomed to a limited supply of water there is no reason why rain-water should not be looked upon as a direct source of supply where the cost of a piped supply is prohibitive." The problem is an immediate one, and not merely that of a number of old cottages, for over 30 districts are dependent on this water-supply, and the new houses and bungalows that are being built are constructed on the same system, except that the water is universally collected in iron gutters and led down iron pipes; slate and asbestos cement sheets replace the older tiles, and the tanks in the new buildings are protected from pollution. The kind of house that is being erected at the present time is a bungalow for four with a roof area of 575 sq. ft. and a tank of 1000 gallons capacity, thus providing—at the rate of five gallons per head—for a drought of the traditional 40 days. The Ministry's report points out that rainwater-supply requires supervision and control just as well-water does, and that local authorities ought to be authorised to make the necessary by-laws governing the capacity of the tank and its situation and construction. The size must obviously vary with the rainfall, the presence of secondary sources of supply and the uses to which the water is to be put—occasionally water-closets and even baths are supplied by a rain tank—but the by-laws must ensure adequate distance from any dung-heap, privy, or cesspool, according to the nature of the soil, and should provide that the tank be of slate, stone, cement-concrete, brick and cement, or metal. Wooden barrels are undesirable. If the tank is underground it should be lined with impervious material and should project six inches above the surrounding soil to avoid surface drainage. The supply tap should be three inches above the bottom to avoid drawing off sediment, which, moreover, is apt to be disturbed by a pumping apparatus. At a lower level there should be a drain cock unless the tank is underground, and the tank should be cleaned out annually. By-laws should also require proper provision for ventilation and removal of overflow, and should cover the institution of public supplies from such sources as the roofs of churches and other public buildings.

There are some other practical considerations that arise from the use of rain as a source of potable water. In smoky districts rain-water often has an unpleasant taste which it is extremely difficult entirely to remove, although filtration through charcoal or activated carbon may mitigate the drawback. Speaking generally, the use of rain-water is to be encouraged from the epidemiological point of view. If storage is watertight pollution from human sources becomes impossible, and although the excreta of birds and lower animals may be objectionable, the danger of disease being transmitted by them would seem to be remote. The rat, however, which is a sort of reservoir of leptospiral organisms, has an uncanny facility for reaching all sorts of apparently inaccessible places, and in a few instances typhoid bacilli have been isolated from the excreta of gulls. Should it be considered desirable to sterilise rain-water, this can readily be done by means of chlorine, permanganate, or excess lime. If heat is used it is sufficient to bring three parts of the water just to the boil and to add a fourth part when in five minutes the water will be safe to drink.

PLAGUE PROBLEMS IN NORTHERN ASIA.

THE reports of the North Manchurian Plague Prevention Service are always eagerly awaited for the new light they throw on the ætiology of this disease. During the period covered by the sixth report, which is now before us, there were no severe epidemics of plague and no far-reaching investigations could be undertaken. In the summer of 1928, however, outbreaks of bubonic plague occurred in Outer Mongolia, Shensi, Shansi, and in Fengtien Provinces, resulting in 500 deaths, but the accounts of these outbreaks are not yet complete. Two communications in the present volume are from the distinguished pen of Dr. Wu Lien Teh, who edits the reports. He has reached the conclusion that the fleas of the tarbagan, as well as those of the susliks, or marmots, play an important part in spreading plague in winter as well as in summer. The period of hibernation passed by some of the wild rodents suffering from plague is not, as has sometimes been assumed, a hindrance to the perpetuation of the disease, but is an indispensable link in the preservation of the virus. In the case of the tarbagan some of the animals show signs of recovery from the infection; more frequent probably under natural than under laboratory conditions. Dr. Teh believes that the pneumonic form of plague is dependent upon epizoötics and human cases of bubonic plague. Whatever is done for the eradication of these will eventually help to stamp out the pneumonic form. An article on the international aspect of the problem is worth perusal, as well as the descriptions of the ectoparasites and the amœbæ of the tarbagan, the habits and nesting burrows of Transbaikal rodents, and a discussion of the problems of cholera and scarlet fever in China and Japan.

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[1] Advisory Committee on Water: Report on Rural Water Supplies. 1929. H.M. Stationery Office. 9*d*.

NORDISK MEDISINSK TIDSSKRIFT.

THE birth of a new medical journal is apt to provoke that sentiment to which Abernethy is said to have given voice on facing a large new class of medical students. But there is no need for pessimistic forecasts in the case of *Nordisk Medisinsk Tidsskrift*, as it has a very definite place to fill, and its sponsors are both numerous and influential. Already there are two classes of medical journal in the Scandinavian countries—the strictly national journals, published respectively in Danish, Finnish, Norwegian, and Swedish, and the inter-Scandinavian series of "Acta" published in English, French, and German. Now the new journal, a weekly, is inter-Scandinavian also, but it is published in one or other of the Scandinavian languages (all good Scandinavians read each others' languages), and so, at the cost of not being very intelligible to extra-Scandinavians, it has retained its Scandinavian character in word as well as in thought. The first two numbers follow conventional lines, a certain number of original articles being followed by short abstracts of other Scandinavian journals. The format is pleasing, and the technical work shows evidence of the professional hand. The regional editors are E. Meulengracht (Copenhagen), B. Runeberg (Helsingfors), R. Gording (Oslo), and G. Holmgren (Stockholm), while the editorial committee includes V. Bie, N. Rh. Blegvad, E. Warburg (Copenhagen), G. Becker, S. A. Brofeldt, F. Langenskiold (Helsingfors), O. Hanssen, O. Scheel, A. Tanberg (Oslo), H. Bergstrand, A. Lichtenstein, G. Liljestrand (Stockholm). Special subjects each have their own sectional editor, the names of whom appear on the title-page of the issue. The editorial offices of the journal are at Eriksbergsgatan 1 A, Stockholm.

THE RAY TREATMENT OF ANGINA PECTORIS.

THE treatment of angina pectoris has always constituted a difficult problem. No satisfactory medical procedure exists, and the operative therapy is uncertain and dangerous. One application of ray treatment is that introduced by Prof. A. Henriques, of Tulane University, who claims[1] to have relieved high blood pressure, with its attendant anginal attacks, by gamma rays from 50 mg. of radium applied for an hour to each side of the skull at a point just in front of and a little above the external auditory meatus. In France a number of communications[2] on the X ray treatment of angina pectoris have been made to the Société Médicale des Hôpitaux. An account of some of these is given by the editors of *L'Année Médicale Pratique*, in this year's edition of that valuable reference book.[3] The volume contains two articles by Dr. C. Lian and Dr. R. Barrieu, one dealing with results and the other with indications and technique, constructed from a large number of papers. Dr. Lian is also the editor of the year book. The authors' pathological investigations showed that angina pectoris is a wide syndrome, including all the paroxysmal conditions in the precordial region which are accompanied by thoracic constriction and pain radiating into the left arm. They term it "the cry of distress of the cardiac plexus." The sedative action of X rays on other peripheral and visceral syndromes encouraged their trial in angina; and after some initial reverses the authors claim to have evolved a method successful in 87 per cent. of cases. The relative insensitivity of muscle tissue to X rays prevents the treatment from having a bad effect on the heart; as they remark, the heavy doses given for cancer of the left breast do not cause cardiac injury. Nevertheless, the treatment should not be undertaken in the aged, in those with severe incompetence, or during crises, but diathermy may be applied in the attack. The authors prefer radiations of moderate penetrating power and minimal doses spread over a large number of treatment. Dr. A. Nemours's technique employs a 25 cm. spark, a filter of 5 to 6 millimetres of aluminium, a current of 2 milliampères, and a focal-skin distance of 30 cm. Applications may be made either from in front or behind. The anterior field is divided into two parts, the upper measuring 10 cm. by 10 cm. and situated over the second intercostal space, and the lower situated just beneath and a little to the outside. The posterior fields, of the same dimensions, are respectively above the spine of the shoulder-blade and below it. Irradiation is carried out for 20 minutes at a time, three times a week, only one field being treated at each session. The whole treatment takes from four to six weeks. A variation is that used by Dr. Marchal, who administers progressive doses. His factors are the same as those of Dr. Nemours, except that his tube current is 2·5 milliampères instead of 2; he irradiates a field 20 cm. in diameter situated over the inside of the third left intercostal space, and one of the same dimensions over the third dorsal vertebra. During the first week the patient receives three treatments of five minutes and about 200 Rontgen units each, two in front and one (the second application) behind. In the second week the time is extended to ten minutes, and so on, increasing at the rate of five minutes a week, until the end of the fourth week. A fifth week is given in particularly refractory cases. The authors consider that the progressive doses are preferable, as they attain the same results as the fixed dose with a smaller amount of energy. We look forward to the publication by English radiologists of their results with this form of treatment.

PREVENTION OF JUVENILE RHEUMATISM.

THE interest which has been aroused of recent years in the menace of rheumatism in childhood, and which was brought to a focus at the Bath conference last year, shows no sign of abating. On all sides there is evidence that physicians, hospital and school officers, and public health authorities are casting round for means by which the information collected at this conference may be applied to the prevention of rheumatism and its attendant evils. Dr. T. W. Hill, assistant medical officer of health of Willesden, has been at pains to set out[1] what he regards as the essential steps in prophylaxis, and he makes some suggestions which, even if they may be in some respects Utopian, can yet be of service in pointing towards an ideal. He emphasises the fact that the earliest premonitory symptoms of rheumatism frequently occur in the pre-school, not the school, age. If these children are to come under observation the provision of some kind of inspection in nursery schools is necessary. He regards as an essential preliminary to any effective campaign the registration of all "pre-rheumatic" children—i.e., children "of rheumatic heredity, direct or remote." He does not, however, attempt an estimate of the approximate number which this survey would include; it seems not unlikely that, according to the somewhat nebulous criteria at our disposal, this category would comprise a considerable proportion of the child population. Dr. Hill recognises the housing question as the main factor in causation which can be attacked at present. He puts forward a number of suggestions for the elimination of damp, and refers hopefully to the experiments in glass and concrete construction which have been described in America. On the vexed question of tonsillectomy he is in substantial agreement with the majority of recent writers. He is emphatic in condemning indiscriminate removal, and would await the infection of tonsillar glands or the occurrence of repeated sore-throat. In children who already show signs of rheumatism the results which he observed did not inspire optimism. He concludes that the only hope of success lies in early operation, but even this did not always avert cardiac disease in the cases which he observed.

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[1] The Radiological Review: Second Radium Number, 1929, ii., 97.

[2] Bull. et Mém. de la Soc. Méd. des Hôp., 1928, iii., 919, 1030.

[3] Eighth year. Paris: René Lépine. Pp. 621.

The Medical Officer, March 23rd, p. 123.

INDUSTRIAL CONDITIONS OF THE DEAF AND DUMB.

AT the request of the British Deaf and Dumb Association the National Institute for the Deaf has inquired into the industrial conditions of the deaf and dumb and has issued a report.[1] It is estimated that there are some 40,000 persons in the United Kingdom who were either born deaf or became so sufficiently early in life to prevent the natural development of speech. This is about 1 per 1000 of the population, a number surprisingly big for an estimate which does not include those who become more or less completely deaf in youth or adult life—that is, the "deafened" and the "hard of hearing." Of this large total it is doubtful if even half are known to the 50 special welfare organisations which exist in this country for the care of the deaf, and in many large districts no provision of any kind exists for the welfare of these unfortunates. It will be recalled that the education of deaf and dumb children came under the care of the Board of Education in 1894, and their educational status was greatly advanced when the Education Act of 1921 made it obligatory on education authorities to provide for the special education of every deaf child. Yet according to the Board's statistics, only 4151 deaf children attended special schools in England during 1927. The Institute regards the special school as of first necessity since the instruction there provided creates a distinctive medium of impression and expression in lieu of the naturally acquired and ready speech of normal children. This process is necessarily slow, and although children do not leave until they are 16 they are still seriously behind the normal standard in acquired knowledge and the ability to express it. Even with the power of lip-reading and artificially acquired speech the deaf child is never on the same plane in ready understanding and the use of language as the child who hears, although investigations have shown that on the whole deaf children are no less intelligent even if more sensitive and retiring than their fellows. From the economic standpoint it is clear that the deaf are potentially the most remunerative of all the physically defective classes, provided they are given a fair chance. But being compelled by their infirmity to remain in special schools until 16 years of age, they have less chances of competing with adolescents who have already gained two years' experience in their several crafts. Both the health and unemployment insurance schemes demand payment for employees at 16 years of age, thus further weighting the scales against the deaf. The various liability and compensation Acts are sometimes cited by employers as reasons for refusing to engage deaf workers in view of a prevalent (but unverified) fear that the deaf are more liable to accidents than those who can hear. Apart, however, from trades involving dangerous machinery, experience suggests that the deaf employee with his quickness of eye and sensitiveness to danger is as immune from accidents as one with normal hearing. The present position is that in those areas from which statistics could be obtained some 40 per cent. of the male and 47 per cent. of the female deaf are only casually employed, if at all. In other localities the position is no doubt worse. It is computed by the Institute that 20 per cent. of the deaf are of high and 60 per cent. of average intelligence; with suitable training and help in finding jobs all of these should be capable of skilled employment. Between 15 and 18 per cent. will only be fit for unskilled jobs, and the small remainder with definite mental defect will be unemployable. Since the difficulties are partly a question of legislation and partly of employment in special trades and crafts, it would require an official inquiry for their solution. Prevention is outside the scope of the Institute's report, but it is now generally agreed that many acquired types of deafness can be obviated, in part or in whole, by early detection and attention. It is on the earliest years of life that the light of preventive and therapeutic measures should be focused.

ARRESTED RESPIRATION IN INFANTS.

SOME years ago Dr. G. F. Still described in our columns[1] five cases of what he termed attacks of arrested respiration in the newly-born and suggested that these attacks were probably due to some affection of the respiratory centre. A. Peiper[2] has lately given a full and interesting account of this curious condition, linking up his observations with work on the situation and nature of the respiratory centre in man. At the beginning of his paper he quotes experiments on the respiratory centre in animals, especially those of T. Lumsden in cats. This worker described four centres situated in the pons and medulla. In the upper part of the pons there is a "pneumotaxic centre" which exerts periodic inhibition on the next lowest centre termed the "apneustic centre." This centre, if cut off from all influences coming from above, causes prolonged inspiratory tonus or holding of breath. Experimental lesions at a lower level, approximately in the middle of the medulla, cut off the influence of the apneustic centre and the experimental animal can now only inspire by gasps, though expiration is still properly performed. Lesions just below this level cut off the power of expiration and leave only gasping, so that the lowest centre is known as the gasping centre. These results have some importance if they can be confirmed in the human subject, and it is only by observing respiratory disorders and their pathological basis that this may be done. Having this end in view Peiper has studied several examples of respiratory failure in infants, recording the respiratory movements upon smoked drums. The attacks of sudden cessation of breathing which he has investigated occur during the first few days of life and especially in infants premature and under weight. The first attack may be sudden and without warning, and very often comes on during feeding. Breathing suddenly stops, the colour becomes blue, the heart sounds are distant, the muscles relax, reflexes are abolished, and the child lies in a narcotic state. Death may supervene in the first attack, but more usually, just as death seems imminent, the mouth is opened, there is a gasp, and respiration is re-established; the normal colour and action of the heart quickly return and reflexes can be obtained again. These attacks may be repeated and not infrequently the child succumbs in one of them. (In Still's series there were four deaths in five cases.) Peiper thinks that the lesion is in the respiratory centres, though the exact pathology remains obscure. Treatment, he says, must aim at stimulating these centres and keeping the heart going during the attacks. The child should be watched literally day and night, so that artificial respiration can be started the moment an attack begins. Pure oxygen is a less valuable stimulant than oxygen to which 5 per cent. carbon dioxide has been added for its effect on the centres. Lobeline is said to be useful, and an intramuscular injection of 0·003 g. as a single dose is advocated. Adrenalin may be injected direct into the heart as a last resort if the child seems to be on the verge of death.

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[1] Report of an Inquiry by the National Institute for the Deaf, 2, Bloomsbury-street, London, W.C. 6d.

[1] THE LANCET, 1923, i., 431.

[2] Jahrb. f. Kinderheilk., March, 1929, p. 129.

Such studies as these may help to elucidate some of the physiological and pathological aspects of respiration. Besides throwing light on arrested respiration in infants they have a bearing on the so-called asphyxia neonatorum.

CLOSED PNEUMOLYSIS.

In many cases of pulmonary tuberculosis, including most of those occurring in early adult life, artificial pneumothorax is the only method of treatment that offers any prospect of cure. The success of such treatment depends chiefly upon obtaining effective collapse of the diseased lung. If the collapse is incomplete ultimate spread of infection to the opposite lung is almost inevitable. In a recent article Dr. R. C. Matson[1] says that the success of artificial pneumothorax treatment is "almost in direct proportion to the number and character of adhesions present" and attributes 40 per cent. of its failures to this cause. The attempt to stretch adhesions by increasing the intrathoracic pressure is seldom satisfactory, and is not without danger. Grave risks are also incurred when open operation is performed. Less danger and a greater measure of success have attended the cauterisation of adhesions by the method of closed pneumolysis devised by Jacobaeus, whose thoracoscope permits a clear view of the offending bands and thus enables their severence to be effected with the galvano-cautery. Risk of hæmorrhage and of the liberation of tuberculous infection is stated to be lessened if an endotherm is used instead of the cautery. Before deciding to operate Matson rightly insists that there should be reasonable assurance that the patient will recover if a satisfactory collapse is established. The rules which guide the physician in deciding to induce a pneumothorax will obviously determine his decision whether to persist in his efforts to establish a complete collapse. Matson gives three chief indications for cauterisation: (1) incomplete collapse due to adhesions; (2) satisfactory collapse maintained only by high intrapleural pressures which involve discomfort to the patient and risk of rupture of the lung; (3) when in a previously satisfactory pneumothorax the organisation of bands, or adhesions, is causing expansion of the collapsed lung. The benefit that may be expected from intrapleural pneumolysis in the hands of an expert is shown by Matson's own records, for he was able to convert a partial into a complete pulmonary collapse with the abolishment of cough and expectoration in 63 cases out of a series of 100. It is perhaps needless to add that this method of treatment should only be employed by those whose experience of collapse therapy is extensive, and who by constant practice have mastered the necessary technique. The correct use of the thoracoscope and the manipulation of the endotherm or cautery demand the highest degree of skill.

ANTITOXIC SERUM IN SCARLET FEVER.

There is no longer any doubt that certain strains of streptococci produce a true toxin, in addition to a destructive substance, "hæmolysin," which does not seem to fall into that category. Such streptococci are chiefly associated with scarlet fever; and two strains, known to bacteriologists as "Dick" and "Dochez," are recognised as being true toxin-forming strains. The toxin produced by streptococci is not comparable with that of diphtheria, save in that an antitoxin is procurable, for it is not the chief weapon of the organism. It is of slight virulence to laboratory animals, though when concentrated, as by the methods of Percival Hartley and R. J. V. Pulvertaft, it is lethal to rabbits. Where, as apparently in scarlet fever, the toxic action of the organism predominates in the clinical picture, the use of antitoxin is followed by excellent results. But the invasive action of the organism is not dependent on the toxin-production.

Many problems remain. In the first place, are all streptococcal toxins, even in scarlet fever, the same? The famous Park strain of diphtheria bacillus is known to be the best toxin-producer, and to yield a high antitoxin of general utility. There is doubt whether a similar strain can be found among streptococci. Wadsworth, Kirkbride, and Hendry[1] bring forward evidence to show that, in fact, the best antitoxins are provided by the Dochez strain—which is fortunate for dwellers in England, where this strain is used to make antitoxin. They further throw doubts on the keeping qualities of the antiserum, which needs careful control. The most urgent necessity, however, is for an adequate method of standardising antitoxin. The accepted one, in America, is the neutralisation of skin test doses in susceptible men. M. B. Kirkbride and M. W. Wheeler have substituted a similar test on goats. In this country the protection of rabbits against death, within a specified time, from intravenous injection of living organisms has been used, with excellent results, by C. C. Okell and H. J. Parish. More recently Hartley and Pulvertaft have suggested the use of concentrated toxin on rabbits; Hartley's method is highly commended in the latest annual report of the Medical Research Council. Wadsworth finds by the skin test method a great variation in the value of antitoxin. Some have as many as 600 units per c.cm.; others are utterly useless, having no demonstrable antitoxin. So long as human beings are necessary for the purpose of standardisation, the antitoxin is of necessity limited in amount, expensive, and, it must be said, unreliable.

There is sufficient proof of the efficacy of this antitoxin, when really standardised, to make it urgent that the problem should be further examined. The introduction of animal tests may put this work on a new footing.

THE GASTRIC DIGESTION OF MEAT.

Some important observations on digestion have lately been made by M. E. Rehfuss and G. H. Marcil,[2] who have compared the results obtained by a fractional test-meal of the usual carbohydrate type and one composed of 60 g. of scraped meat, the two meals being given within 48 hours of each other. After the meat meal they found that the acid response in the normal was 30 per cent. higher and two types of response were noticed, one prompt and decided and the other slow and indifferent. Meat is a true intragastric stimulant and in health is capable of producing the maximal response from the gastric mucosa. The response in disease is no less interesting. Though, as they point out, only a limited number of cases have been investigated, too few to allow of complete generalisation, three groups may be separated. While in purely functional cases and in those with peptic ulcer the meat produces the extra acid response, there was no response to either carbohydrate or meat meal in pernicious anæmia, gastric carcinoma, delayed resolution in lobar pneumonia, and chronic cholecystitis. The intermediate stage, in which the meat response is present but is less than normal, is furnished by such cases as cardiac or renal disease, blood dyscrasias, and "other conditions commonly encountered in medical ward service." In these cases the power of the stomach to deal with meat is merely lowered and not lost. It is suggested that these variations in the response to a meat and carbohydrate meal may be regarded as a measure of

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[1] Amer. Rev. Tuberc., March, 1929, p. 233.

[1] Amer. Jour. Hyg., March, 1929, p. 371.

[2] Jour. Amer. Med. Assoc., March 9th, 1929, p. 763.

[illegible] efficiency and that persons who give a [illegible] response to bread and meat, as shown by the [illegible] test-meal, cannot be regarded as normal.

This work is illuminating and suggests several possibilities. It throws light on those puzzling cases where acidity and acid regurgitation are complained of by patients who on investigation, with a carbohydrate meal, show a subacidity amounting even to achylia. The interpretation of the fractional test-meal is beset with pitfalls. It is usually carried out under conditions anything but pleasant or normal to the patient, who is as a rule nervous; the meal itself is unappetising and often distasteful; it is digested in the prone position or partially reclining, with a foreign body in the stomach causing a certain amount of discomfort and usually producing excessive secretion of mucus. There is often a tendency to place too great faith in results obtained under these abnormal conditions, for while it is true that most of these drawbacks may disappear with several examinations, very few patients will consent to become proficient in this method of investigation in the interests of scientific accuracy. The same objection—namely, examination under abnormal conditions—may be urged against other methods daily employed, but this does not answer the objection; it merely sounds a note of caution against accepting results too literally. To this inherent limitation of the fractional test-meal Rehfuss and Marcil have added another in showing how great is the variation of response to different food stimuli. Their work must make the medical man look again at some of the diets he orders. Are we not often too nervous of ordering good red meat for our patients, and giving in its place some patent or partially digested sloppy pabulum which we cheerfully call a "light diet"? Often it is anything but light to the patient. Would it not sometimes be better to clean the gastric lining membrane, make sure the teeth are adequate and efficient, and then try the effect of, say, a nicely cooked chop, carefully masticated, with a couple of slices of dry bread? In tropical climates raw meat juice is of great value where milk is badly borne by an infant with summer diarrhœa and vomiting. The complete change seems to put the child's stomach on its mettle and it usually responds to the challenge.

Apart from its valuable suggestion of a new test for the efficiency of the gastric mucosa, this paper seems to show that we have not sufficient faith in the adaptability of our stomachs.

ANTIVENEREAL MEASURES IN THE STRAITS SETTLEMENTS AND MALAYA.

MORE than forty years have passed since, after an agitation conducted with relentless fervour by Josephine Butler and her friends, the Contagious Diseases Acts, 1864–69, in this country were repealed. An echo of the controversy surrounding this reversal of policy is to be heard in the arguments set out by a committee[1] appointed by the Secretary of State for the Colonies to examine a Straits Settlements Ordinance (No. 15 of 1927) and a Federated Malay States Enactment (No. 18 of 1927). These provisions are substantially similar, their object being to diminish the spread of venereal disease. The sections to which the attention of the committee has been drawn are those permitting the compulsory medical examination of any individual prostitute when there is reason to suspect her of suffering from venereal disease. After careful consideration of the local situation, as well as the general problem, they advise that these sections of the ordinance and enactment shall be held strictly in reserve, and eventually, when alternative legislation can be passed rendering illegal the keeping of brothels, shall be repealed. This does not imply that the committee do not view with sympathy the dilemma which has led to the attempt to strengthen the hands of the local authorities in enforcing the existing law, but that they hold, in agreement with expert opinion in most countries, that the use of compulsion in any form is likely to destroy the atmosphere of encouragement to make the fullest use of the provisions made for free treatment.

The local position is difficult to understand without some reference to the history of the legislation now in force. When, in 1886, Mrs. Butler and her co-workers had convinced Parliament that the subjection of prostitutes to periodical medical examination was a gross interference with the liberty of the subject, besides being useless as an antivenereal measure, the wave of feeling rose so high as to overflow to the Colonies, as far as legislation was concerned, before public opinion there was educated to the need for a change. In the Straits Settlements the system of compulsory medical examination of prostitutes was thus abruptly brought to an end in 1888, and in 1894 the registration of brothels was discontinued there, and also in the Federated Malay States. Unfortunately the local authorities, though they had to obey directions from the Home Government, were not convinced that the innovation would not lead to an increased incidence in venereal disease, as well as to further exploitation of prostitutes, who are, for the most part, non-Europeans of a low type. Fruitless efforts have more than once been made to induce the Home Government to consent to a re-introduction of registration and periodical medical examination, on the grounds that the incidence of venereal disease was increasing. In 1898 the representations were effective to the extent of securing an amendment to the law in both colonies whereby brothel-keepers were made subject to fine or imprisonment if a prostitute in their houses carries on her trade while suffering from any contagious disease. Unfortunately for the success of this scheme, which has now remained in force for some thirty years, some of the brothel-keepers fined for the offence are known to have recovered the money from the prostitutes concerned. The obvious countermove of imposing terms of imprisonment without the option of a fine proved ineffective, since the keepers realised that proceedings could only be based on medical evidence, which in turn could not be obtained without the consent of the woman; if they could persuade her to refuse examination they were safe from prosecution.

This, briefly, was the situation which, in 1927, led to the framing of new provisions which would prevent such evasion of the law. The committee have evidently given the complex situation the most careful thought, have examined many witnesses, and have come to the considered conclusion that, whatever its purpose, the punishment of a prostitute for not complying with a requirement which is not applied to the community generally is not justifiable, and that even the provision penalising brothel-keepers, which was framed at a time when the present system of treatment of venereal disease had not been developed, is now obsolete. They advocate in its place the extension of the powers of closing brothels already possessed by the authorities, in order to prevent a keeper of a closed brothel from starting another. When the policy of suppressing known brothels, which should be actively pursued, has resulted in their decline, legislation rendering illegal the keeping of a brothel should replace the existing provisions. Meanwhile free facilities for the treatment of venereal disease in men and women should be extended, and to this end financial provision should be made for the employment of highly qualified medical men and women at all clinics and dispensaries, and for a development of the health visitor service. The report deserves study by all concerned with the control of venereal disease. It epitomises knowledge painfully gained in the struggle to combat venereal disease throughout the world.

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[1] The committee consisted of Lord Balfour of Burleigh (chairman), the Hon. Mrs. Alfred Lyttelton, Dr. F. Barrie Lambert, Mrs. Neville Rolfe, Sir O. E. Warburg, and the Rev. W. C. Roberts, with Mr. G. L. M. Clauson as secretary.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCXCII.—THE TREATMENT OF LOW BLOOD PRESSURE.

HYPOTENSION may be said to exist when the systolic blood pressure falls below 110 mm. mercury. A low blood pressure is a symptom of many diverse affections. It does not constitute a whole clinical picture as may be the case with hypertension. In most instances it does not even form the dominant feature of the case, though there are notable exceptions to this. The treatment of low blood pressure, therefore, may merely be incidental to that of the underlying condition, but occasionally it is justifiable and even advisable to direct treatment principally to this one symptom.

Patients with low blood pressure may conveniently be divided into three groups: (1) those requiring no treatment; (2) those in whom treatment is usually unavailing; (3) those in whom it is requisite and usually attended with some success.

Patients requiring no treatment.—Many healthy people have a persistently low blood pressure without untoward symptoms; athletes may, indeed, be found amongst this group. No treatment is required, and if instituted would probably do harm. In patients over fifty, moreover, low pressures are often prophetic of longevity and these patients are regarded as good insurance risks.

Cases where treatment is unavailing.—In this category is included "*status lymphaticus*," where the heart and great blood-vessels are smaller than normal and the arterial pressures correspondingly low. It is evident that little or nothing can be done for such patients except to advise such prophylactic measures as prevent any undue strain on the cardiovascular system. The condition styled by Martinet "hyposphyxie," characterised by general malnutrition, blue extremities, and cardiovascular hypoplasia, does not yield very well to treatment, though general tonic measures—good food, well regulated exercises, and massage—may do something to improve the patient's condition. This applies also to the treatment of those types of neurasthenia which are accompanied by hypotension.

Cases requiring treatment.—These cases fall naturally into two classes, those in which treatment is urgent, such as hæmorrhage and shock, and those in which the hypotension is merely one of several symptoms requiring attention. These may be considered in more detail.

Hæmorrhage and Shock.

The low blood pressure of shock or hæmorrhage is largely due to diminution of circulating fluid, either through capillary stasis or through direct loss of blood. In both cases the amount of blood returning to the heart is notably decreased. The treatment, therefore, consists in replacing this fluid by giving ample liquids by mouth, by use of rectal salines, or best of all by the injection of subcutaneous salines. Several pints of fluid may be absorbed from the loose tissue of the mammary or axillary regions in the course of a few hours.

If the blood pressure falls to 60 mm. death usually occurs and if the readings approach this value, therefore, the more rapid effects obtainable by intravenous administration of fluids are necessary. Salines are of value given in this way, but since shock is partly due to loss of colloids, especially hæmoglobin, solutions of gum acacia may be substituted with advantage. Theoretically the appropriate method of replacing the lost fluid is by blood transfusion, particularly in cases of severe hæmorrhage, where it may be repeated, though in many instances salines or gum acacia seem to be equally beneficial. Serum to a pint of which ♏vii., to ♏viii. of 1/1000 adrenalin have been added is also of value, given intravenously, and is recommended by French authors.

The insufficient cerebral circulation consequent on the fall of blood pressure must be treated by posture; the pelvis should be raised, the head lowered, and the limbs bandaged. The usual precautions in shock regarding warmth and quiet also play an indirect part in restoring the blood pressure to normal.

Anaphylaxis.—In addition to the usual nursing principles applicable to all forms of shock, adrenalin seems to be of considerable value in combating the hypotension in anaphylaxis. It should be given subcutaneously in doses of ♏v. to ♏x. of liq. adrenalin hydrochlor., and as its action is evanescent it may be repeated.

A fall of blood pressure may also occur in *anæsthesia* accompanied by symptoms resembling those of traumatic shock. These symptoms can usually be avoided by careful precautionary measures, the routine examination and careful selection of all patients for anæsthesia, avoidance of undue exposure, maintenance of warmth, and choice of a suitable anæsthetic. Chloroform is more likely to produce a fall of blood pressure than other anæsthetics.

The use of *spinal anæsthesia* is contra-indicated in patients with low blood pressure, but where the pressure falls after its use—a not uncommon event—the patient should be kept in bed with the head downwards during and for two days after the operation. In urgent cases intravenous administration of adrenalin, or in less severe cases, intramuscular pituitrin are of great help. Ephedrine and ephetonin also have their advocates.

When, before operation, the blood pressure is very low, due to shock or hæmorrhage, every effort should be made to restore it to normal figures before commencing any surgical procedures. For this purpose blood transfusion or intravenous salines are most helpful.

Conditions of which hypotension is a less urgent, but still important feature, include certain forms of cardiac disease, acute and chronic infections, and various endocrine disorders. In these it has already been emphasised that the fall of blood pressure is only one symptom in the clinical picture and the treatment must, therefore, be that of the whole syndrome. Occasionally, however, in some of the conditions to be mentioned the hypotension is so marked as to form the most important feature of the case and require special attention.

Hypotension in Cardiac Disease.

Low pressures are not common in cardiac disease, whether valvular or myocardial, except in the terminal stages. A sudden fall of pressure in a patient with *hypertension* usually portends serious heart failure, and the patient should have absolute rest in bed with a light diet at first, and suitable warmth. Digitalis is of value if there are signs of back pressure such as œdema and engorged veins, but will otherwise have little effect. Pituitrin in doses of 0·5 c.cm. twice daily may be given intramuscularly with good effect in some cases, but it must be used with care. Similar treatment is suitable in the terminal hypotension of myocarditis.

In *chronic valvular disease* with decompensation the blood pressure is frequently a little above normal, and with improvement in the patient's condition tends to fall. It is thus inadvisable to attempt to reduce the pressure. If, however, hypotension exists from the beginning together with signs of passive congestion, digitalis and rest in bed may be effective in restoring normal pressure.

With *auricular fibrillation*, although the estimation of blood pressure is difficult owing to the variability in the size of the ventricular beats, the average readings may afford a rough guide as to the variations present. In cases with low pressure, if the ventricular rate is rapid, return to normal figures may be obtained by correct administration of digitalis. This should be given either in the form of the tincture in doses of ♏xx. t.d.s. or as Nativelle's digitaline gr. 1/240 t.d.s.

Bradycardia is often accompanied by hypotension and this is especially marked in cases of Stokes-Adams seizures. For the latter condition adrenalin in doses of ♏v. to ♏x. subcutaneously is of great value; possibly part of its beneficial action is due to its effect in raising the blood pressure.

Hypotension in Acute Infections.

Hypotension is a frequent symptom of pneumonia, typhoid fever, influenza, diphtheria, cholera, and other infections. Its treatment will vary accordingly, but as the low blood pressure is mostly due to a combination of two factors these will require special attention. The two factors are myocardial weakness and vaso-motor paresis; treatment varies according as to which factor predominates. In treating myocardial weakness it is essential that the heart shall have ample time in which to recover from the toxic changes which have occurred. For this purpose a prolonged rest in bed is necessary, preferably with the head low; all active movements on the part of the patient should be strictly limited. This is particularly important in cases of pneumonia and diphtheria. When myocardial involvement is suspected in these cases, the period of rest should be extended to from six weeks to two months after the cessation of pyrexia. It is doubtful if drugs have any beneficial action on the myocardium in most of these cases, but digitalis may be useful. In those acute infections where the condition resembles that of shock, cases with sudden pallor, cyanosis, and collapse, pituitrin may be of considerable help.

The second factor, loss of vaso-motor tone, probably plays a larger part than the myocardial factor and especially accounts for the persistence of hypotension after subsidence of the fever. It can probably be treated best by carefully graduated exercises, for example, the Schott exercises practised at Nauheim, or by well-regulated Swedish drills. Massage forms a very useful adjunct. Amongst drugs, strychnine holds an important place for its stimulant action on the vaso-motor centres. It may be given by mouth in doses of 4 minims of the liq. strychnin. hydrochlor., or on more urgent occasions as hypodermic injections of gr. 1/32 three times a day. Indiscriminate ductless gland therapy is to be deprecated, but careful use of adrenalin, given hypodermically in small doses (♏iii. to ♏v), is of value, or whole gland suprarenal (gr. v.) may be given by mouth. Ephedrine hydrochloride gr. ss. twice or three times a day may also be employed, but it is still on trial.

The diet in cases of low blood pressure should be full and nutritious with an abundance of milk, eggs, and cream. Meat should be allowed in reasonable quantity, but it does not seem advisable to overburden a convalescent patient with large amounts purely on the grounds that it is usually restricted in cases of high blood pressure. Similarly, the use of articles rich in extractives, such as liver, kidney, sweetbreads, or meat extracts, although contraindicated in hypertension, are not on that account to be advocated for hypotension. Alcohol should in general be avoided in view of the fluctuations in blood pressure which it produces, but when hardship is entailed by its complete withdrawal small amounts of whisky may be allowed.

Cholera requires different treatment from the other infections, since the low pressure is due directly to loss of body fluids. Similar hypotension may occur in any severe diarrhœa. The fluid must be replaced by oral, subcutaneous, or intravenous administration of salines according to the urgency of the case.

Hypotension in Chronic Infections.

Low blood pressure occurs very consistently in pulmonary tuberculosis and careful search must be made for signs of this disease in cases with persistently low pressure without obvious cause. Treatment will be that of the lung condition; the hypotension rarely needs special attention.

Another possible cause of persistent hypotension is some focus of infection such as may occur in chronic appendicitis, cholecystitis, in root abscesses of the teeth, low grade infections of the genito-urinary tract, and so forth. Treatment consists in the discovery and eradication of the infected area. This may involve surgical intervention or the use of vaccines.

Hypotension in Endocrine Disorders.

The most definite of these is *Addison's disease.* The treatment of this condition is not very satisfactory, but a combination of whole gland suprarenal given by mouth together with carefully spaced subcutaneous doses of adrenalin may do something to raise the blood pressure and relieve the patient's symptoms.

Some types of *pituitary insufficiency* are associated with low blood pressure, and the rational treatment for these cases is the administration of pituitrin 0·5 c.cm. twice daily, intramuscularly, together with whole gland pituitary by mouth.

One further condition may be mentioned under this heading, for although little is known about its ætiology, certain facts suggest its association with a ductless gland dyscrasis—namely *postural hypotension.* In this complaint the hypotension occurs on changing from the recumbent to the erect posture. Some cases are associated with visceroptosis and for these a good abdominal belt with masasge and exercises are of value. Strychnine is also useful. Recently ephedrine has been praised in this connexion and may be tried in doses of gr. ¼ every three hours for several days.

E. NOBLE CHAMBERLAIN, M.D., M.Sc., M.R.C.P.,
Cardiologist and Assistant Physician, Royal Southern Hospital, Liverpool.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdr. R. E. Rampling to be Surg. Comdr.
H. L. Belcher to be Surg. Lt.
Lt.-Comdr. (Retd.) C. H. Petrie to be Comdr. (Retd.).
Surg. Lt. H. L. Duncan is appointed to the *Virid.*

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Lt. T. C. Larkworthy to be Surg. Lt.
Surg. Lt.-Comdr. C. C. Elliott is appointed to the *Repulse.*

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. P. Davidson, having attained the age for compulsory retirement, is placed on retd. pay.

Maj. R. P. Lewis to be Lt.-Col., vice Lt.-Col. P. Davidson.

Maj. J. D. Kidd retires, receiving a gratuity, and is granted the rank of Lt.-Col.

Lt. L. R. H. Keatinge is secd. for duty with the Sudan Def. Force.

TERRITORIAL ARMY.

Maj. T. H. Richmond, having attained the age limit, retires and retains his rank, with permission to wear the prescribed uniform.

Capt. J. O. Thomas to be Maj.

Maj. R. C. Aitchison (Capt. Res. of Off.) resigns his commn. in the T.A.

Lt. D. R. McGregor resigns his commn.

INDIAN MEDICAL SERVICE.

Maj. Mozaffer Din Ahmed Kureishi to be Lt.-Col.

Temp. Capt. Daulat Manghirmal Lala, the relinquishment of whose temp. commn. has been notified, is permitted to retain the rank of Capt.

HOSPITAL ACCOMMODATION AT LIVERPOOL.—At the annual meeting of the Royal Southern Hospital, Liverpool, Mr. Allan Paton, the President, suggested that the voluntary hospitals of the city should be superseded by one large hospital with ample accommodation for all patients, including private patients of the middle and upper classes. Such an institution should be within easy reach of the University and served by small casualty stations and ambulances in appropriate parts of the city.

Special Articles.

MEDICAL WOMEN'S INTERNATIONAL ASSOCIATION.

THE PARIS CONGRESS.

THE second quinquennial congress of this Association, which was founded in 1919, was held in Paris from April 10th to 16th, the meeting-place being appropriately the Institut International de Coopération Intellectuelle (Palais-Royal), lent by the League of Nations. Nearly 300 medical women were present, including representatives from America, Austria, Belgium, Bolivia, Canada, Denmark, France, Germany, Great Britain, Hungary, India, Italy, Japan, Norway, Poland, Spain, Sweden, Switzerland, and Yugoslavia. The business done included the transfer of the office of the Association from London, which has been the headquarters for the past five years, to Paris, since for the next quinquennial period the officers have been elected from among the French medical women. Lady Barrett, Dr. Jane Walker, and Miss Louisa Martindale retired from the offices respectively of president, treasurer, and honorary secretary, and are succeeded by Dr. Thuillier-Landry, Dr. Réguin, and Dr. Montreuil-Straus. The newly elected vice-presidents are Lady Barrett (Great Britain), Dr. Tayler-Jones (United States), Dr. Mathilde Salzmann (Germany), Dr. Carcupino Ferrari (Italy), Dr. Dagny Bang (Norway), and Dr. Nechkovitch-Voutchetitch (Yugoslavia). Apart from the general business and the council meetings, considerable effort had been made to provide interesting matter for discussion at the sessions devoted to the consideration of two problems of especial import to medical women. The first of these concerned

Sex Instruction for Children and Adolescents.

Two members had been chosen to circularise selected medical women in the various countries and to summarise their replies to a questionaire in a form which would readily show what, if any, methods of sex education were being pursued in different lands and would moreover bring to light any new suggestions as to procedure or organisation of instruction. In view of the excellent surveys prepared from information received by Miss L. Martindale and Dr. Montreuil-Straus, the actual discussion, which took place on April 11th, was rather disappointing. Matters of general agreement were that a child's earliest questions as to the transmission of life should be answered without evasion, since in this way he acquired some knowledge before it had any emotional significance for him. Most contributors regarded the mother as the most suitable person to give teaching to very young children, and stressed the importance of providing her with opportunities to equip herself to do so. At present parents often fail to give this teaching, the poorer classes having no vocabulary and the better educated being reluctant to embark on the subject. The doubt was raised whether even the present-day parent is likely to be able to answer questions without affective tone, but the majority of contributors believed that she could be taught to do so. As to older children, the impression given was that a definite programme of sex instruction in schools would not be welcomed by the majority of parents in Norway, England, Hungary, and Spain, whereas parents in Sweden, Germany, and Switzerland are complacent if not eager for such instruction. In France opposition to any innovation comes from those parents who have no experience of modern methods of instruction. In this connexion it is interesting to note the attitudes taken in official circles in different countries. For example, in Norway the State does not encourage the authorities controlling the universities, training colleges, or schools to provide sex instruction in any form. On the contrary, those who have attempted such teaching have met with some resistance, and permission to use a text-book—described as "very good"—of health instruction containing a brief introduction to sex hygiene has been withheld. Of the other countries, the attitude in Germany forms the greatest contrast. Thousands of private as well as public lectures are given annually. Among the sections of the community who organise lectures are party political associations, associations of housewives, the trades-unions, associations of landlords, and religious organisations. Elementary and secondary school teachers attend compulsory courses in sex hygiene and in the recognition and guidance of psychological manifestations of sex instincts in adolescents. Chairs for sexual pedagogics are established at three German universities.

Some pertinent suggestions were made at the congress by various delegates. It was generally held that sex instruction to the young should form

Part of a group taken at the Clinique Baudelocque (Maternité). Prof. Couvelaire in centre.

part of courses of biology, anatomy, and physiology or hygiene and should not be given a special prominence. The deliberate omission of the reproductive system from consideration in any classes where structure, functions or hygiene of the other systems of the body are being explained is still the custom in some text-books and classes and is to be condemned. Several contributors stressed the mistake of giving different information to boys and girls, on the grounds that a single standard of knowledge is conducive to a single standard of morality.

The other subject discussed was

Analgesia in Midwifery.

Reports on this subject were collected by Dr. Doris Kunckel (Germany) and by Dr. Nechkovitch-Voutchetitch. All the contributors were agreed that there exists at present no ideal method of inducing analgesia in midwifery. Those which produce complete analgesia are not free from danger either to mother or child, or from unfavourable effects on uterine contractions. On the other hand, nearly all those replying to the questionaire agreed that even if the pain of labour is physiological and not pathological—a point on which there is no unanimity—every effort should be made to find harmless means to relieve it. The main drawback of inhalation anæsthesia is that it can only be applied in the second stage of labour, and even then, in its most usual form, chloroform and ether, only for a comparatively short spell. Opinions as to the advantages and disadvantages of chloroform and ether revealed no surprises, but considerable variation in practice. In France chloroform is popular and also a mixture of ether (60 parts), chloroform (20 parts), and ethyl chloride (10 parts). Nitrous oxide combined with oxygen was praised by speakers from America, England, and Germany, since it is free from danger, rapid in action, quickly eliminated when administration ceases, has no toxic effects, and does not diminish uterine contractions. It can be used safely in cases of cardiac, pulmonary, and renal disease. It has, however, the serious drawback of requiring a large and cumbersome apparatus and a specially trained person for its administration, and is therefore only suitable for use in a hospital. Moreover, it has sometimes to be supplemented by ether or chloroform.

Lumbar and sacral anæsthesia were not recommended for normal labour. Paracervical anæsthesia—the injection of novocain-adrenalin solution into the tissues and into the os uteri, combined with injections into the pudic nerve and large doses of pituitary extract—is said by some to lead to such a degree of relaxation of the cervix and perineum that the child's head meets with no resistance. It is contra-indicated in cases complicated by fever, gonorrhœa, and pelvic inflammation. The method appears to be worth further investigation.

As to twilight sleep, notwithstanding the considerable amount of success achieved by this method, it has important drawbacks and is not likely to be universally adopted. Pernocton and avertin were regarded as still in the experimental stage.

The administration of an analgesic in the second stage in normal cases was advocated by most of the American, British, German, and Scandinavian contributors for humane reasons. The danger of diminishing the force of the pains, of thus prolonging labour, and increasing the proportion of cases requiring interference was not overlooked; but, on the other hand, pain itself may be the cause of delay, or its intensity may determine the decision to hasten delivery by forceps when this is not inevitable. Representatives of French, Italian, Polish, and Yugoslavian medicine reflected a definite tendency in these countries to deprecate the administration of anæsthetics in normal cases, on the grounds that none yet available is completely innocuous to mother and child.

Visits to Institutions.

During the congress visits were paid to various hospitals and institutions. Prof. Couvelaire escorted a large party round the Clinique Baudelocque, a maternity hospital where accommodation for antenatal work and infant welfare as well as for the actual conduct of labour is spacious and the equipment admirable. Specially attractive features are the glass cubicles in the waiting-rooms to avoid infection of one patient by another, and the fact that while mothers and babies may spend the first days of the puerperium together in cheerful wards, there is no general labour ward, each patient being delivered in the privacy of a single room. The department for septic cases is housed in a separate block and cases of venereal disease are also treated, before or after confinement, in a well-warmed and lighted department where their convenience as to times of attendance is studied. The Clinique Baudelocque is only one of many " maternités " serving different areas in Paris, but it is one of the most modern in design and enlightened in administration. As regards tuberculosis, this clinic works in collaboration with the Hôpital Laënnec which was shown to some of the members of the congress by Dr. Jules Marie in the absence of Prof. Léon Bernard. Here mothers in whom tuberculosis has been detected at the clinic or elsewhere are brought with their infants, whether or not the latter have a positive Pirquet reaction. The infants are installed in a ward on the ground floor and are kept as much as possible in the garden; the mothers, warded on the first floor, are said to derive some comfort from watching them from the balcony. After six weeks, during which the Pirquet reaction is carefully watched, temporary cottage homes are found for those children who remain healthy, since experience shows that if they show no signs of infection at this stage they are likely to remain well. Recently a ward has been allocated to tuberculous fathers of young infants, the children also being admitted for observation.

On the surgical side a visit was paid to the Salpêtrière, where Prof. A. Gosset described the surgical clinic of 250 beds under his control. His department consists of a clinic of the Faculty of Medicine, of an anticancer centre, and of the various laboratories and X ray departments necessary to a surgical department. The Salpêtrière is an admirable example of the adaptation of an old hospital to modern requirements and the beautiful buildings and gardens were envied by those who work in towns where hospitals have had to cover nearly all their spacious grounds with buildings.

An opportunity was taken to visit a new clinic for children, opened in February last by Mr. Loucheur, Minister of Labour and Hygiene. This clinic has been organised under the Red Cross by the Association des Dames Françaises and is situated at 146, Avenue de St. Ouen, near the centre of the industrial area of Paris. The clinic is under the direction of Dr. R. Massart, to whom its inception is due, and who is himself responsible for the surgical department Other services include medical, orthopædic, ear, nose, and throat, antenatal, and dental departments, and there are three cots where children can rest after tonsillectomy. An operating theatre, X ray department, and pathological laboratory complete the picture. This miniature hospital is evidently welcomed by the practitioners of the neighbourhood and patients who pay what small sums they can afford are already plentiful. Here, as in some of the larger hospitals, precautions are taken to avoid the spread of infection by glass divisions in the waiting and dressing rooms.

At the Pasteur Institute Dr. Calmette, and at the Institut de Radium de l'Université de Paris Prof. Regaud, received members, while visits were also paid to the Musée de l'Hôpital Saint-Louis and the Musée de Guerre du Val-de-Grâce.

Social Activities.

The success of the congress was due to the great enthusiasm of the Association Française des Femmes Médecins in devising a programme and in procuring for the members so many agreeable social amenities. From the opening session on April 11th, when the rector of the Académie de Paris and the hospitable director of the Institute in which the meetings were held welcomed the members, an international spirit of cordiality prevailed. The president of the Senate received members in the Palais du Luxembourg, the Municipality of Paris at the Hôtel de Ville. Parties were given by various women's organisations and a dinner by the Association Française des Femmes Médecins. The reception given by Mme. Thuillier-Landry on the evening preceding the official opening was an admirable way of breaking the ice. The cordial spirit in which all delegates and members were greeted was appreciated especially by those who came from remote countries. The congress broke up in the assurance that for the next five years the affairs of the Association would be in safe hands and that its prosperity and influence would be still further extended.

CRIME IN ENGLAND AND WALES.

THE STATISTICS FOR 1927.

THE annual criminal statistics for England and Wales do not appear very punctually. Those for the year 1927 (Cmd. 3301, H.M. Stationery Office, 4*s.*) have just been issued by the Home Office. They give the first information of the working of the two important statutes which in 1926 amended the law of coroners and of death registration.

Coroners and Death Registration.

These two Acts have cost the country slightly more. Deaths rose from 54,111 in 1926 to 60,511 in 1927, but expenses rose from £67,123 to £93,666. No one will grumble if this means that, as Parliament intended, the coroner is getting more expert assistance in his task of investigating the cause of death. Full advantage is apparently not yet being taken of the facilities in this direction. The 1926 Act authorised coroners to obtain a post-mortem examination and report by a qualified practitioner and, if thereupon satisfied that no further inquisition was necessary, to dispense with an inquest except where there was cause to suspect violence or unnatural death and except in the case of deaths in prisons and other special circumstances. The Home Office comments on the fact that in one English and four Welsh counties and in 22 English and two Welsh boroughs no advantage was taken in 1927 of this machinery. The actual totals of post-mortem examinations requested or directed by coroners were 12,904 in inquest cases and 3616 in non-inquest cases. Increasing motor traffic presumably accounts for the upward trend in deaths due to accident. In 1927 as many as 15,135 deaths were attributed by coroners' courts to accident or misadventure—nearly 2000 more than in 1924.

The Increase in Suicide.

Suicide is another phenomenon which is increasing out of all proportion to the increase of population. The comparative figures here are startling. In 1856 there were 1314 cases; if the figure of suicides had merely kept pace with the figure of population, the total for 1927 would have been 2711, whereas in fact it was 4863.[1] It would be interesting to know whether the medical profession has been conscious of any such increase and, if so, to what causes it is to be ascribed. No great rise was noticeable before 1914; during the war there was a sharp fall in the rate; but since the last stages of the war there has been a swift leap from under 3000 to over 4500 suicides a year. The attempted suicide, it is noted, is being humanely treated. The first object is to find some relative or friend who will undertake to look after the person who committed the attempt. The Home Office discloses the fact that for many years it has advised police forces not to proceed against the accused where this object is attainable, unless there is some special reason such as the commission of a crime, threats to renew the attempt, previous attempts, habitual intemperance, or indications of insanity. In the last-named circumstances it may be essential that the accused person should, in his own interests, undergo a period of detention under skilled supervision. Here there is another change in the law to be mentioned. Three years ago (as the result of the Criminal Justice Act, 1925) it became possible to dispose of a charge of attempted suicide at petty sessions instead of, as formerly, to go to the expense, delay, and publicity of committing the accused for trial on indictment. The magistrates, therefore, can now impose a sentence of detention, and this course was taken in two-thirds of the proceedings in 1927, while, for the humane reasons already mentioned, no proceedings at all were taken in 1970 out of the 2724 cases of attempted suicide of which the police became aware. The "sex and age" table shows the usual disproportion between the totals of males and females on whom inquests were held. About twice as many inquests are held on males as on females; the figures for 1927 are 21,555 males and 10,872 females; in 1924 the respective figures were 20,849 males and 10,852 females.

Infanticide.

Inquests were held on the bodies of 276 children suffocated whilst in bed with their parents or others; in 22 of these cases an open verdict was returned, in the remainder the verdict was accidental death. There were 485 inquests on the bodies of newly-born children; in 28 cases a verdict of wilful murder was the result, in one case it was manslaughter, and in six cases it was infanticide. The usual introductory note to the criminal statistics by a member of the Home Office establishment draws special attention to the five years' working of the Infanticide Act of 1922. The Act seems undoubtedly to have achieved its purpose of diminishing the charges of murder against women who kill their babies while mentally deranged by recent childbirth. On the other hand, juries who before 1922 were inclined to bring in verdicts of mere concealment of birth instead of murder now seem willing to find verdicts of infanticide rather than concealment of birth. Of seven women convicted of infanticide in 1927, four were bound over without supervision, one was sentenced to 15 months' imprisonment, one to 12 months, and one was sent to an institution for mental defectives. Next year the writer of the introductory note might usefully enlarge upon the offence of criminal abortion. Recent prosecutions and the general practitioner's experience indicate that the official figures could be interestingly elaborated. The quinquennial averages for the present century of persons tried on indictment for procuring abortion have been 11 for 1900–04, 20 for 1905–09, 30 for 1910–14, and 43 for 1915–19. From 1920 to 1926 there were the following remarkable fluctuations: 35, 39, 19, 22, 44, 62, and 41. The 1927 figure was 44; 14 were men, 30 were women; 10 were acquitted, 1 was sent to penal servitude, 27 to imprisonment, and 6 were bound over. The statistics, of course, give no idea of the number of cases of strong suspicion taken up by the police.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—An open meeting will be held in the Hastings Hall, British Medical Association House, on May 3rd, at 8.30 P.M. A report of the Cancer Research Committee of the Marie Curie Hospital on three years' work on the treatment of cancer of the uterus with radium, with demonstrations of technique and cases, will be given by Miss M. Chadburn, Dr. G. Hurdon, and Dr. Helen Chambers. This will be followed by a discussion to be opened by Prof. Louise McIlroy, Miss E. Bolton, and Miss L. Martindale. The meeting is open to all members of the medical profession.

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[1] In reply to a recent question in the House of Commons the Home Secretary gave the total figure for the year 1928 as 4845 (3381 males and 1464 females).

MODERN PHYSICAL TREATMENT IN RELATION TO RHEUMATISM.

BY R. FORTESCUE FOX, M.D., F.R.C.P.,
PRESIDENT OF THE LIGUE INTERNATIONALE CONTRE LE RHEUMATISME.

IN the present century physical treatment has undergone an unexampled development. Many kinds of energy have been utilised in medicine, one after the other. The long list of physical remedies now includes, in *radiotherapy*, radium and rontgen rays, Finsen's light, luminous and thermal, infra-red and ultra-violet rays, solar radiation and skyshine; in *movement*, exercises, manipulation, and mechanical treatment; in *electrotherapy*, besides the older forms, ionisation, diathermy, and the cautery knife; in *hydrotherapy*, a great extension of methods for applying heat and cold and mechanical energy in baths of water, vapour and hot air, not to mention local hyperæmia by heat or ligature.

So wide a therapeutic field naturally lends itself to irregular and partial exploitation; some one form of treatment, such as electricity, manipulation, or light is vaunted as the sole and sufficient cure. The popularisation of particular methods and the unfounded claims put forward by uninstructed persons gravely hinder the right development of physical treatment. It should be remembered, on the one hand, that this group of remedies, which are commonly called "natural," have always powerfully attracted both simple and educated people. On the other hand, it is equally true that from one cause or another a practical knowledge of their action and uses has not been included in the training given to medical men. Such a discrepancy between public demand and professional supply constitutes at the moment an evil which cannot be ignored. In the meantime the right attitude for the practitioner is well defined by a philosophical French writer:—

> "We are in danger of opposing our ideas the one to the other; progress in remedial exercises does not imply falling back in surgery; the use of waters does not oblige us to abandon the pharmacopœia . . . the specialist who tries to embrace too much injures his own speciality . . . the medical man who has only one means of treatment at his disposal is always poor, and sometimes dangerous. . . . That need not hinder us from carrying on our studies in one class of remedies, but it will prevent our giving to these remedies a disproportionate and above all an exclusive importance."[1]

Basal Facts.

The basal facts upon which physical treatment is founded are so familiar that they are almost forgotten. It is forgotten that life is maintained by a constant succession of physical stimuli, and that even the slightest changes in the physical medium are inevitably reflected in physiological changes in the organism. The human body, on account of its highly developed organs of contact, is almost incredibly sensitive to external conditions. Meteorological instruments can scarcely record changes of air of which many invalids are immediately aware.

It is true that young and strong persons can adapt themselves better than most animal and vegetable species to variations of temperature and altitude. But this primitive human power of acclimatisation to all kinds of physical conditions is usually at least in abeyance in civilised communities. It can be recovered in vigorous persons and by special training, but it is very much and permanently circumscribed in the majority of individuals. Intolerance of cold is met with at the two extremes of life, in infancy and in old age, often indeed beginning in middle life, also in certain races, and in susceptible but otherwise sound persons at all ages, in many states of depressed or failing health, after acute illness, and above all in many states of chronic illness, such as the "rheumatic" diseases. Of many chronic disorders it is a very striking characteristic; the physiological reaction to cooling of the body which takes place at once in vigorous subjects is more or less absent. Persons so affected must, like delicate plants, be temporarily or permanently protected against uncompensated cooling or "chill."

When a normal adaptation fails a series of abnormal reactions generally occurs. For example, in a "frigo-sensitive" subject the effects of exposure to a cold and changeable climate include repeated lowering of the body heat, abnormal contraction of the superficial blood-vessels, and alteration of the distribution of the blood, with reflex disturbances of the nervous, digestive, metabolic, and eliminative functions. Another significant effect of lowering the temperature of warm-blooded animals is an increase of liability to many forms of microbial infection. On the other hand, if in the same frigo-sensitive subject external heat or friction are skilfully applied, the subnormal temperature of the skin and of the body is restored to normal, and the peripheral circulation, metabolism, and circulation are increased. So far, then, as the functional disorders provoked by external cold are concerned, it is clear that a curative influence may be brought into play which is akin to the provoking influence.

Speaking generally, the object of physical treatment is to bring physical forces into action upon the surface of the body, so as, by a new series of impressions, to produce favourable reactions within the body. The student of physical treatment has to explore these different forms of surface action and to endeavour to define their precise application in all states of defective and abnormal function.

Physical Treatment as a Whole.

The stimuli received by the body at any time operate not singly but as a whole. Further, they are in process of transformation, for one form of energy always generates another form of energy. The green leaf at a given temperature and moisture receives rays and transmutes them into chemical, thermal, and electrical effects. The normal skin also, like the green leaf, has the power of receiving and transmuting energy. Climate includes humidity, warmth, movement, radiation, electricity, and perhaps something more. The human body is able by its organs of contact to respond at the same time to all these external stimuli. Physical treatment provides a new physical medium, by means of which defective contacts are re-established between the body and the energy outside the body. The normal contacts of life and the integrity of the reactions which are essential to health are in this manner restored.

The optimum physical treatment gives the optimum physiological reaction. It is questionable whether this is ever effected by simply increasing a single kind of stimulus. It is generally produced by a series of harmonious and increasing impressions of more than one form of energy. Thus, in an effervescent or carbonic acid bath the relative external heat and mechanical and chemical stimulation in the gas are combined with relative cold in the water, acting over constantly changing areas in the skin, the whole making up a special form of circulatory stimulation. Again, a light bath in the Alps combines an extreme degree of cold with unusual radiant energy. In a sea or surf bath all these elements are united in varying degree.

The resultant of impressions may be considered as *sedative* or *stimulant*. Baths and climates are regarded as stimulant if they increase, and sedative if they diminish, nervous and circulatory activity. But in practice more often than not both sedative and stimulant effects can be traced under all forms of physical treatment. In practice, especially in the treatment of rheumatic conditions, sluggish reactions in one part are often stimulated at the same time that over-action in another part is allayed.

It is, moreover, worthy of note that mental effects follow physical causes. The Aberdeen philosopher, Bain, used to say: "Heat is a typical form of passive physical pleasure."

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[1] Faure, Felix: Internat. Congress Physiotherapie, Paris, 1909.

Dosage.

Duration is the "fine adjustment" of dosage and should be precisely governed by individual reaction. It is known that thermal applications given in series produce in favourable cases better and more rapid reactions as day follows day. The new phase of circulation following thermal baths may continue for several hours with little change, and, if the patient is not chilled in the interval, this improved phase may not be entirely spent before the next bath. For this reason chronic maladies in particular are often benefited by a properly dosed and spaced course of applications, given in specially warmed buildings and spread over several weeks. After such a course a lasting improvement in the response of the body to external stimuli is often obtained.

A course of such treatment is tantamount to providing an artificial climate, the operative factors of which can be varied at will. Although the change of surroundings can be only temporary, the activity of the physiological response is so great that results are produced quite out of proportion to the duration of the stimulus.

Examples.

Many examples could be cited to illustrate the changes in the deep parts that may be effected by surface actions.

1. A bruised or wounded limb becomes cold and dusky, with tender and painful swellings or scars, unresolved exudations, and increasing limitation of power and movement. If such a limb be subjected to a bath of whirling or agitated water at 112° to 115° F. the arteries and capillaries dilate and the immersed part takes on a rosy pink colour. The scars and muscles can now be freely manipulated without pain, the joints moved more easily than before, and with repeated treatment the processes of healing and resorption are greatly accelerated.

2. Another example of both cutaneous and deep reactions is afforded by subthermal baths, such as are given as a sedative measure for mental cases. During the war they were used in England as "sedative pools" for conditions of nervous and mental shock. Men so affected were as a rule restless, often sleepless, with subnormal deep and surface temperatures, and a small rapid pulse. They were made to recline for an hour or more in gently flowing water at from 92° to 94° F., according to the season. During the bath the heart's action became slower and more tranquil, the surface and deep temperatures returned to normal, and sound sleep followed.[2]

3. The effervescent bath also, given at subthermal temperatures, is often of great assistance in cases of myocardial weakness with a chilly skin and contracted arteries. During the bath the radial artery may be observed to dilate, the pulse to become slower and stronger, and the parts immersed to flush from relaxation of the capillaries. This is an illustration of the autonomous reaction of the cutaneous capillaries to physical impressions, described by Krogh.

4. An impressive example of deep reaction to surface stimuli is seen in the effect of cold upon metabolism. The exposure of the body to moderate degrees of cold, in baths or fresh air, may in health much more than double the activity of metabolism. Leonard Hill, among others, has shown how important such facts have become in the treatment of chronic disease, and that cooling of the body is one of the most powerful of therapeutic weapons.

5. Winternitz, in his last published paper, set forth his experience of the use of cold in tuberculosis, and formulated rules for its application. It is only in the present century that it has been recognised that this infective disease, in whatever part of the body it may be situated, is best treated not by specific but by physical remedies. It should, moreover, be noted that in tuberculosis these remedies act best not singly but when judiciously combined after the pattern of Nature, as when radiant energy is conveyed to the body cooled by moving air or water.

The Physical Physician.

The reader may now be prepared to agree with Vierordt that the serious study of physical treatment marks a turning-point in the history of medicine. The work of reclaiming this field of practice was begun by clinical physicians in the last century. The trained and qualified physical physician will have for his special task the investigation and treatment of incipient and chronic diseases. He belongs to the school which pursues the study of disordered functions. He finds the nerve centres irresponsive or oversensitive; the blood-vessels, in general or in particular areas, contracted or relaxed; the normal distribution of the blood displaced; the rhythm of the heart or of the digestive functions disturbed; there are failures of elimination; metabolism is increased or diminished; the equilibrium of body heat is lost; the resistance to infection has lapsed. He believes that disturbances of function such as these are characteristic of chronic disease, and experience teaches him that, as van Leyden said, these disturbances are more amenable to physical remedies and change of habit and of diet than to drugs. His concentration of mind upon the functional element in all disease obliges him above all to investigate and measure the reactions to external impressions, because the character of these responses, changing from day to day, furnishes the key both to his diagnosis and to his treatment. His rôle is therefore that of a therapeutic research worker.

[*Subsequent articles will be devoted to continental practice and teaching and to the physical treatment in rheumatic diseases.*]

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

The Backward Child.

FIFE is one of the most important educational areas in Scotland and any facts about it are likely to be paralleled elsewhere. Much significance therefore attaches to observations made in this county which are described in the annual report of the Scottish Education Department. It appears that of the pupils who left school in 1926–27 (excluding those who died, migrated, or were untraced) 64 per cent. left without having completed two years of post-primary education—that is without having qualified even by attendance for the award of the day-school certificate (lower). This certificate is the leaving certificate of the day school; as such it should be obtainable by any pupil of normal ability who has been in regular attendance at a day school up to the statutory age and has worked with ordinary diligence. Yet 64 per cent. fail to qualify for it. Others leave from the senior division without ever participating in any form of post-primary education. The chief causes of the retardation are said by the teachers to be, in order of frequency, lack of ability, migration, ill-health, low power of application, late enrolment, irregular attendance apart from health, and unsatisfactory home conditions. It is hinted that a jury composed not entirely of teachers and headmasters might possibly have added other items to this catalogue.

To speak generally, not more than from 10 to 12 per cent. of our school-children, including mentally defective children, are of less than normal intelligence; yet 64 per cent. fail to reach the stage of the day-school certificate (lower). What is needed as a remedy is individual attention by a patient, intelligent, and sympathetic teacher. But behind this there is the question whether we are not asking too much of the average child of 12. Suggestions are made for "a very slight lightening of the ship." This raises the question of the functions of the secondary schools. There is a growing disposition on the part of parents to secure to their children the advantage of the secondary schools; but owing partly to this leakage from below and a further leakage at the secondary school stage, "the proportion desiring a leaving certificate was extremely limited."

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[2] Fox, R. F.: Physical Remedies for Disabled Soldiers, London, 1917.

This report is a very important deliverance, since the whole problem of the higher education is based upon the leaving certificate. Knowing the long history of struggle and difficulty in the establishing of the leaving certificate as an active method of maintaining the intellectual standard, I can only regret this note of pessimism; but, on the whole, to those that have known Scottish education for 50 years, the wonder is that the certificate has been so successful. As the psychological experts are now getting a better grip of educational conditions, there is a tendency to belittle "examinations" as a mental test; but this is only a passing phase. In actual practice, the examination test, in the past generations, has worked wonders, and if in later years it has become over-exacting, this is merely a defect of every such general method of testing. One cannot but revert to the same struggle in Germany nearly 100 years ago. A full account of it is given in Matthew Arnold's "Schools and Universities in Germany." This book is probably not now read very widely; but it was one of the stimulants that led to the British equivalent of the German leaving certificate (Abiturienten examen). In Germany the specialisation of the schools probably began at too early a stage and became too rigid; but there can be no question that the elaborate scheme framed by von Humboldt originally did place German secondary education on an extraordinarily efficient basis. The Scottish system had to rest on a different type of existing school; but, on the whole, the results must be pronounced good. No doubt the special problem emerging at the end of the elementary school course will now receive much more detailed attention and we may hope that the results will be satisfactory. The economic question is troublesome; but many forces are now converging to persuade the general public that the condition of education beyond the elementary stage is one of the cardinal methods of preparing an efficient people and, in the end, of improving economic conditions.

Hospital Amalgamation.

The annual report of the Edinburgh Royal Maternity and Simpson Memorial Hospital states that the total number of cases treated last year was 3205, compared with 3117 in the previous year. As regards the proposed amalgamation with the Royal Infirmary, some progress has been made. The report points out that it is generally recognised that the situation has considerably altered since Nov. 16th, 1923, when the project of amalgamation was first mooted, owing first to doubts which have arisen as to whether the provision of maternity service is not the province of the State rather than of the voluntary hospital; and, secondly, the possible effect of the De-rating Bill. Committees representing the Royal Infirmary and the hospital have discussed the maternity problem in Edinburgh, and how many beds the managers of the Royal Infirmary should be expected to provide in the new buildings to be erected on the site of George Watson's School, and have arrived at the conclusion that not less than 120 beds are needed.

Dr. A. S. Macgregor, medical officer of health for Glasgow, has issued a circular to owners and occupiers of premises which are liable to rat invasion, calling attention to the fact that since the Rats and Mice (Destruction) Act, 1919, came into operation an endeavour has been made by the Department of Agriculture for Scotland to inaugurate a rat week in the spring of each year, a period when repressive measures are most likely to be successful. Dr. Macgregor says that the services of the inspectors [illegible]ic Health Department, in an advisory [illegible] made available to any person wishing

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Urgent Health Problems in Ireland.

Dr. E. E. Stephenson, the Chief Medical Adviser of the Department of Local Government and Public Health, acts wisely in taking the public into his confidence from time to time about the health problems which are of importance to the country. Last week he gave a useful and informative interview to the press. Among other things he stated that there was an urgent necessity for the appointment of county medical officers of health in the various counties where such appointments had not yet been made. Whilst the novelty of the situation and adverse financial circumstances had caused delay, further delay could not be condoned. There was no county in the Free State, he said, that was without special health problems calling for solution. Among those of the most pressing importance were the eradication of typhoid fever and diphtheria, the prevention and correction of crippling, the reduction of infant mortality, and the protection of women against the special dangers associated with childbirth. In some counties, notably Limerick and Monaghan, the maternal mortality-rate was so high as to establish an incontestable need for organised supervision over midwifery practice. Certain chronic areas of typhus infection, notably in Kerry, Galway, and Donegal, were not alone a danger to the community, but a reproach to the public administration and a menace to the credit of the country. Again the recent disastrous experiences at Carrick-on-Shannon, where some 50 people contracted typhoid fever from a contaminated water-supply, was largely due to the absence of an expert controller of the public health services. Dr. Stephenson drew attention to the high mortality in Ireland from heart disease, much of which was preventable. The early discovery of the conditions leading to heart disease could be secured by medical inspection of school-children. With regard to trachoma and other causes of blindness he said that the pensions payable in the Irish Free State on account of blindness due to preventable causes amounted to £10,764 a year. Among 12,000 children inspected in Dublin 7000 suffered from defects, of whom 5000 required immediate treatment.

Irish Medical Association.

At its last meeting the council of the Irish Medical Association nominated Mr. P. E. Hayden, Vice-President, for election as President. Mr. Hayden is surgeon to Jervis-street Hospital, and a member of the Council of the Royal College of Surgeons in Ireland. The Council nominated Dr. Eugene Byrne, of Slane, Meath, for the Vice-Presidency. He is a very old member of the Association and has been a member of the Council for several years.

PARIS.

(FROM OUR OWN CORRESPONDENT)

The "Tuscania" Incident.

THE steamship *Tuscania* and her passengers ill with small-pox have not roused in France as much interest as in England. In fact, were it not for the diplomatic side, the incident would have been considered of little importance. The reason is simple. In France vaccination against small-pox is not a matter for discussion; it is an accomplished fact. There may be a few doctors who, in theory at least, consider that vaccination may under certain circumstances be harmful or ineffective. But even they do not always accept the responsibility of forbidding vaccination in their practice or among their own family. No case of the kind has occurred, but it is certain that a court of law would award big damages against the family doctor if a child died of small-pox under his care, and it was established that he had forbidden vaccination. French law makes vaccination compulsory for every infant before completing its second month of life, and fines its guardians in case of default.

Laws are accepted in France only if they are justified by necessity and use, and this is certainly the case with compulsory vaccination. The last real epidemic of small-pox occurred in France during the war of 1870–71. Shortly afterwards vaccination was made compulsory, and nothing hindered the execution of the law, for everyone had in mind the dreadful remembrance of the small-pox fatalities among the civilian and military population during the Siege. Nor has this been forgotten since. The first thing that happened in 1914 after the departure of the troops towards the frontier was the vaccination of the civilian population, creating the first queues at the gates of hospitals or dispensaries. If the facts are analysed further it is realised at once that small-pox in France is a particularly severe disease and has been so throughout the whole history of the country. Case mortality has rarely been under 50 per cent. and has reached 80 or even 90 per cent. in certain epidemics. This explains much. The figures are in complete contrast with those gathered in English statistics, but they are nevertheless quite trustworthy. The same fear of consequences ensures that every case of small-pox is registered and nearly all are sent to hospital, so that it cannot be argued that only severe cases are registered. There is no doubt on this point, and I have often observed, even in the Indian statistics, a similar difference in mortality between the five French towns and the British towns of the same land, as given by the Health Committee of the League of Nations.

What is the efficiency of the compulsory vaccination law? To this question every Frenchman (with the exceptions mentioned above) will answer that the law is perfectly efficient—if it were not, the law would have dwindled out of use, as it has almost done for the compulsory notification of measles. In addition to the compulsory vaccination of infants, new vaccination is exacted for entrance to school, to military service, before taking up work in public or private offices, at matriculation for universities, and so on. Hence at several points of life new vaccination becomes an obligation by the simple mechanism of public life. In case of epidemic, actual or threatened, powers have been given by law to the *maires* of each town or borough to render vaccination compulsory for all inhabitants, whatever their age. The *préfets*, who are at the head of the administration of each department (county), have powers of compulsion should the *maire* default.

At the present time there are hardly any cases of small-pox in France. When cases do occur it is invariably because there has been some neglect in the application of vaccination, and the epidemic is stopped at once by immediate vaccination of the surrounding population. In fact, were the French territory closed in by a Chinese wall, small-pox would never be seen. Nearly all the cases are foreigners who have escaped vaccination, for the most part natives from North Africa or Spaniards, who are always ready by some trick or other to elude collective vaccinations at the frontiers. One thing is certain; there is no chance for tourists in France to catch small-pox unless they hire a weekly room in the filthy slums where the immigrants dwell on their arrival, and even there the chance is small.

Anti-Diphtheria Vaccination.

Though inoculation against typhoid is compulsory in the army, small-pox is still the only disease against which civilians in France are obliged to be immunised. Two years ago the Government explored the possibility of compulsory prophylaxis against diphtheria, but it was generally agreed that any legislation to this effect should be postponed, official aid being meanwhile granted to propagandist measures. The mode of vaccination is by the anatoxin (formolised toxin), studied in France by Ramon, one of the heads of the Pasteur Institute. This has been investigated clinically by Prof. Lereboullet with his assistants, especially Dr. Gournay, and by Prof. Zoeller, of the military school of the Val-de-Grâce. The Pasteur Institute furnished 15,000 doses of anatoxin in 1925 and 300,000 in 1928.

The Ministry of Health has embarked on a special "week of propaganda for diphtheria vaccination" which began last Monday with the broadcasting of a short lecture by the Minister himself, Mr. Loucheur, in which he called attention to the fact that every year 3000 children die from diphtheria and that this could be prevented by inoculation. Special lessons on the subject are being given in every school in the hope that the children will repeat at home what has been told them and that the teaching will thus reach the parents. Lectures are to be broadcasted, and newspapers throughout the country are publishing special articles to spread the gospel of immunisation against diphtheria.

Public Health Services.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 13TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 339 (last week 273); scarlet fever, 1764; diphtheria, 962; enteric fever, 32; pneumonia, 1743 (last week 2158); puerperal fever, 44; puerperal pyrexia, 111; cerebro-spinal fever, 20; acute poliomyelitis, 3; acute polio-encephalitis, 1; encephalitis lethargica, 23; dysentery, 9; ophthalmia neonatorum, 112. No case of cholera, plague, or typhus fever was notified during the week.

The cases of small-pox were notified from the following 26 counties: London, 29 (viz., Bethnal Green, 8; Kensington, 2; Lambeth, 1; Paddington, 1; Poplar, 3; St. Marylebone, 1; Stepney, 10; Wandsworth, 2; Westminster, 1); Cambridge, 1 (Borough); Chester, 1; Derby, 18; Durham, 42; Isle of Ely, 3; Essex, 26 (viz., East Ham, 1; West Ham, 23; Grays, 1; Chelmsford (R.D.), 1; Huntingdon, 4; Kent, 2 (viz., Gillingham, Gravesend, 1 each); Lancaster, 13 (of these Leigh, 6); Leicester (C.B.), 1; Lincoln, Parts of Holland, 4; Parts of Lindsey, 1; Middlesex, 5 (viz., Acton, 2; Edmonton, 1; Hendon, 1; Willesden, 1); Northampton, 39 (of these County Borough, 38); Northumberland, 6; Nottingham, 1; Peterborough, 7 (Borough); Stafford, 44 (of these Stoke-on-Trent, 42); Sussex East, 2 (Brighton); Wilts, 15 (Swindon); Worcester, 1; Yorks, West Riding, 33; Brecknock, 3; (Brynmawr); Glamorgan, 26; Monmouth, 11; and from the Port of Cardiff, 1.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on April 16th–17th was as follows: Small-pox, 200 under treatment, 10 under observation (last week 192 and 10 respectively); scarlet fever, 1501; diphtheria, 1707; enteric fever, 12; measles, 103; whooping-cough, 1102; puerperal fever, 20 (plus 5 babies); encephalitis lethargica, 79; poliomyelitis, 4; "other diseases," 58. At St. Margaret's Hospital there were 14 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was 1 death from small-pox, 1 (0) from enteric fever, 58 (0) from measles, 6 (2) from scarlet fever, 120 (40) from whooping-cough, 39 (6) from diphtheria, 48 (12) from diarrhœa and enteritis under two years, and 247 (47) from influenza.

The death provisionally classified to small-pox was assigned to Acton (M.B.) Great towns reporting 10 or more deaths from influenza were Birmingham 21, Manchester 12. Liverpool reported 19 deaths from measles, Cardiff 7, Birmingham 6. From whooping-cough, Manchester reported 10 deaths, Liverpool 6, and Salford 5. No great town reported more than 5 deaths from diarrhœa.

Deaths from Small-pox.—The fatal case of small-pox reported at Acton was that of a woman, aged 28, four months pregnant in her third confinement. Dr. D. J. Thomas, medical officer of health for the borough, informs us that she joined the *Tuscania* at Port Said on March 23rd, landed at Liverpool on April 1st, and reached her home in Chiswick the following day. She had not been vaccinated since infancy. She became ill on April 5th, with a temperature of 101° F., and backache which was attributed to the pregnancy. She aborted on April 8th, but the pain in the back persisted. On April 9th her doctor received a telephone message that she was dead. On examination he noticed a purpuric rash round the groin, and asked Dr. Thomas to see her. The doctor had not been informed by the patient's friends that she was a small-pox contact, nor had the public health department been notified that she was ill, though inspectors from the department had visited the house and inquired as to her welfare. Dr. Thomas found a purpuric rash on both groins extending on the right side as far as the axilla, there was subconjunctival hæmorrhage, and the beginning of a focal rash (two spots) on the right forearm. On the same day the husband, who was ill, was seen by Dr. Thomas, who found a rash just coming out and becoming confluent. He died on April 16th at Joyce Green Hospital, Dartford.

The number of stillbirths reported during the week was 299 (corresponding to a rate of 40 per thousand births), including 54 in London.

Correspondence.

"Audi alteram partem."

THE NEW IMPORTANCE OF RADIUM.

To the Editor of THE LANCET.

SIR,—In the report of the Radium Subcommittee of the Committee of Civil Research, which you summarised last week, allusion is made (p. 5) to the so-called "surgery of access," which has sprung into existence as the value of radium in medical treatment has been progressively recognised. "We do not doubt," the report states, "that as further knowledge is obtained in regard to the possibilities of this radium-surgery, its use will develop rapidly, and in an increasing measure it will replace the use of the knife in the treatment of cancer." Personally I think a statement like this is likely to mislead not only the public but the medical profession. The main point is whether in the first instance a tumour is susceptible or not to irradiation. Obviously surgery which provides access to a tumour is not going to influence this. Secondly, surgery of access only enables a localised method of treatment to come into play. The logical development of our present-day knowledge is the use of large quantities of radium at a distance from the body, which enables a wide field to be covered and a fairly homogeneous intensity of irradiation to be given to a moderate depth below the surface of the body.

I am, Sir, yours faithfully,

G. E. BIRKETT.

Manchester and District Radium Institute,
April 20th, 1929.

THE "PHYSIOTHERAPY CLINIC" AND THE PRACTITIONER.

To the Editor of THE LANCET.

SIR,—Dr. Ray's letter in your last issue calls for comment. To my mind physiotherapy is too wide a term. It should surely be divided into balneology and electro-therapeutics, the latter requiring skilled and qualified operators. In a leading article which you published some months ago on unqualified electro-therapeutists you called proper attention to this crying evil. Before then I myself had drawn the attention of Dr. Ray and others to the proper remedy for this dangerous practice, which can only be stopped by legislation. The political section of the British Medical Association has, I am glad to say, taken the matter up and it will be pushed through in due course. My suggestion was that no one should be allowed to carry out such treatment unless he had passed a thorough examination in the physics of electro-therapeutics and held a certificate to that effect issued by a proper board of examiners. Then, and only then, will doctors be justified in sanctioning such treatment at the various institutions. Meanwhile they must find time to treat their own patients and to charge accordingly.—I am, Sir, yours faithfully,

W. S. WHITCOMBE.

Harley-street, W., April 20th, 1929.

FUNCTIONAL NERVOUS DISORDERS IN THE SERVICES.

To the Editor of THE LANCET.

SIR,—I was somewhat surprised to notice that in the discussion at the Royal Society of Medicine (War Section) on April 8th (reported in your issue of April 13th, p. 773) no mention was made of the examination of the teeth. Apart from the presence of oral sepsis it is recognised that in certain cases unerupted and impacted molar teeth may, by reflex irritation from pressure of the second molar, be the causal factor of such conditions as neurasthenia, hysteria, chorea, epilepsy, or even insanity. This suggests to my mind that routine radiographic examination of the teeth would assist the diagnosis and indicate a line of treatment. Many cases in which such impacted molars have been found and extracted have greatly improved, and a certain percentage have completely recovered. I know of a physician who, acting as honorary medical adviser to a missionary society, has stipulated that all candidates shall have dental radiograms taken before they are finally accepted as he is convinced that, if the large number of Europeans who are employed and reside in the East had such an examination carried out, many cases of so-called tropical neurasthenia would never occur.

I am, Sir, yours faithfully,

J. D. KIDD, M.B., Ch.B., D.M.R.E. Camb.

Cavendish-square, W., April 22nd, 1929.

INQUIRY INTO THE ÆTIOLOGY OF CANCER

To the Editor of THE LANCET.

SIR,—In THE LANCET of June 16th last (p. 1250), an appeal was made to your readers to help in a statistical research into the ætiology of cancer, by answering a schedule of questions relating to a cancer patient and a non-cancer patient of the same sex and about the same age as control case.

The response to this appeal, though somewhat disappointing, was sufficient to justify printing the schedules and starting the investigation, and some medical practitioners have rendered most useful service by their careful work in completing these forms. In order that sufficient data may be secured more volunteers are needed, and since many of your readers doubtless did not see or give careful consideration to the first appeal, may I again ask that any who are in touch with cases of cancer, whether in general, specialist, or hospital practice, and who are prepared to devote a few hours to assist in this research, will communicate with me at the Galton Laboratory? Unfortunately, it is not possible to offer any kind of remuneration for this service, but I feel sure that there are some who will be prepared to make this voluntary sacrifice of a little time to help in a form of cancer research which can only be carried out by team work.

I am, Sir, yours faithfully,

PERCY STOCKS, M.D., D.P.H.,
Reader in Medical Statistics, University of London.

Galton Laboratory, University College, London, W.C.,
April 23rd, 1929.

THE ÆTIOLOGY OF UROLITHIASIS.

To the Editor of THE LANCET.

SIR,—In your issue of April 20th (p. 847) Dr. Levick says that he does not think that Europeans in the tropics suffer from urolithiasis as the result of excessive exposure to the solar ultra-violet rays. I have no doubt that Dr. Levick is right and, so far as

I know, Europeans in the tropics do not suffer from urolithiasis to a greater extent than their fellows in temperate climates. My suggestion referred to the natives who compose an overwhelming proportion of the populations in tropical countries and who from the nature of their clothing are exposed to the full effects of the ultra-violet rays. This applies especially in the case of children who are also, I believe, the worst sufferers from urinary calculi. Reliable statistics relating to the incidence of calcium phosphate stones in tropical countries are difficult to obtain; but it would be interesting to compare the relative frequency of stone in the European and native populations over a large series of cases. I do not suggest that excessive exposure to ultra-violet light is the only cause of the condition. No doubt sweating and other factors play a part in the ætiology of tropical urolithiasis, but the production of urolithiasis in experimental animals by irradiated ergosterol suggests that further investigation along such lines might throw valuable light on the influence of excessive solar irradiation in producing urinary calculi.

I am, Sir, yours faithfully,

J. CLIFFORD HOYLE.

Pharmacological Laboratory, University of Cambridge, April 23rd, 1929.

Obituary.

SIR GEORGE ADLINGTON SYME, K.B.E.,
M.B. MELB., F.R.C.S. ENG.,

FIRST PRESIDENT OF THE AUSTRALASIAN COLLEGE OF SURGEONS.

WE regret to announce the death of Sir George Syme, President of the College of Surgeons of Australasia, which has been announced by telegram during the week.

George Adlington Syme was born on April 13th, 1859, the son of Mr. George Alexander Syme, and was educated at Wesley College, Melbourne, the University of Melbourne, and later at King's College, London. He graduated in medicine at the University of Melbourne in 1881 and was for two years resident medical officer of the Melbourne Hospital. In 1885, being already M.R.C.S., he took the diploma of F.R.C.S. Eng., and returning to Australia became demonstrator of anatomy in the University of Melbourne in 1887, in which year he was elected out-patient surgeon to the Melbourne Hospital. In 1903 he became full surgeon to the institution, and held this position for 16 years, throughout which period he lectured, first on anatomy and later on clinical surgery, acting also as an examiner at the University in both subjects. He was also surgeon to the police force of the city and honorary surgeon to St. Vincent's Hospital. He was for many years a special correspondent of THE LANCET and was also a prominent supporter of the British Medical Association, being three times President of the Victorian Branch, and a frequent President of various sections at the annual congresses of the Association. He acted as chairman of the Royal Commission on Health for the Commonwealth of Australia, and in many other directions was recognised alike as a sound doctor and administrator.

On the outbreak of war Sir George Syme received a commission as Lieut.-Colonel in the Australian Expeditionary Force and became chief of the surgical staff of the first Australian General Hospital. Later he was appointed consulting surgeon to H.M. Hospital Ship *Gascon*, and at the close of hostilities retired with the rank of hon. colonel, becoming later a member of the medical advisory committee and consulting surgeon to the repatriation commission. In recognition of his military and public services he was created K.B.E. in 1924.

During the last two years Sir George Syme was deeply interested in the foundation and promotion of the Australasian College of Surgeons, and in the difficulties which beset the College on its inception he proved a brave and sincere advocate of the cause which he had at heart. The foundation of the College was viewed with considerable suspicion by many members of the British Medical Association, and by many general practitioners, who considered that the creation of an institution empowered to give an honorary degree might reflect on their own status, and indeed influence for the bad their professional earnings. The aim of the College as set out by Sir George Syme was to promote the art and science of surgery (using the words of the charter of the Royal College of Surgeons of England), and also to act as an organised scheme for post-graduate training in surgery either for graduates wishing to take a higher degree in surgery or for practitioners who with or without such a degree wanted to acquire or improve their surgical skill. The first annual meeting of the College took place in April, 1928, and considerable criticism was meted out to the scheme, but an address delivered by Sir George to the Victorian Branch of the B.M.A. went far towards reconciling adversaries; for he there warned his audience that the newly founded American College of Surgeons might prove a formidable rival unless an analogous institution arose in Australia. In the autumn of 1928 Sir George proceeded to Boston and received the honorary Fellowship of the American College.

Syme was respected and trusted by such a large number of friends and colleagues both within and without his country that his death leaves a real and widespread sense of loss. He is survived by his widow, the daughter of Mr. William Berry, of New Zealand, one son, and two daughters.

ALFRED TAYLOR SCHOFIELD, M.D. BRUX., M.R.C.S. ENG.

Dr. Schofield, whose death occurred at Bournemouth on Saturday last, in the eighty-second year of his age, was for many years known as an enthusiastic worker in support of health and educational causes. He was born in 1846 at Roach Bank, Rochdale, where his father, Robert Schofield, resided. He was educated at Elizabeth College, Guernsey, and entered the medical profession through the medical school of the London Hospital where he was a prizeman. In 1883 he took his conjoint diploma and a year later the M.D. with Honours of the University of Brussels. He practised for a considerable time in Harley-street, and a list of his public activities shows well the range of his sympathies. He was at one time chairman of the Parents' National Educational Union; he was a member of the Council of the Sanitary Institute, of the Royal British Nurses' Association, of the Church Sanitary Association, and of the District Nurses' Association. What may be styled domestic physiology and psychology, especially in their relation to women, were made the subjects of a large literary output; his handbook on personal domestic hygiene, and a volume treating of the borderlands of science proved acceptable to many readers. No one was a more enthusiastic preacher than Schofield of the truth lying behind the aphorism that cleanliness is next to godliness. Dr. Schofield married nearly 60 years ago Miss Frances Vaughan Jackson, by whom he had one daughter.

JAMES PRINGLE PARK INGLIS, M.D. EDIN.

WE have to record the death, on April 10th, of Dr. J. P. P. Inglis, deputy medical superintendent of Leavesden Mental Hospital, Watford, in his fifty-third year. He was the son of the Rev. R. C. Inglis and was born at Berwick, where he was educated at the Grammar School. Thence he went to the University of Edinburgh, and on graduating in 1905 became clinical assistant to the late Sir Thomas Clouston at the Royal Asylum. He later held a similar appointment in London at the West End Hospital for Nervous Diseases, and after experience in mental hospitals at Portsmouth and Canterbury, entered the service of the Metropolitan Asylums Board in 1909. In this service, with appointments at

Caterham, the Fountain Mental Hospital, the Darenth Training Colony, and lastly at Leavesden, he remained until his death, the only interval being caused by the war, during which from 1916–19 Dr. Inglis served with the Royal Army Medical Corps as Mental Specialist to the Forces in Egypt. For his work in this capacity he was mentioned in despatches. Dr. Inglis was married but leaves no children.

DUNCAN OTTO MACGREGOR, M.B. GLASG.

THE death of Dr. D. O. Macgregor, superintendent of Glasgow Victoria Infirmary, removes a well-known figure from medical circles in the West of Scotland. Sixty-one years of age, he was born at Tranent and was educated at Glasgow Academy, George Watson's School, and Berkhamstead School before going to study medicine at Glasgow University. In his college days he was a keen Rugby player. After graduating in 1890, he gained post-graduate experience at Leipzig and as resident house physician at Glasgow Royal Infirmary, and house surgeon at Glasgow Maternity Hospital and the Northern Infirmary, Inverness. Then he took up private practice, first at Cardiff and later in London, and it was with considerable knowledge of general medical work that he started his career as medical superintendent of the Glasgow Victoria Infirmary 29 years ago. In this new sphere his attention turned to the use of X rays and as radiologist to the hospital he later did a great deal in this special department. An able administrator of sympathetic personality, he was popular with both staff and patients. Outside his work at the infirmary he was deeply interested in Highland affairs, and especially in the Clan Gregor.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

LORD MOYNIHAN.

Lord MOYNIHAN (formerly Sir Berkeley George Andrew Moynihan, Bart., K.C.M.G., C.B.) was introduced with the customary ceremony in the House of Lords on Wednesday, April 17th, on his elevation to the peerage. His introducers were Lord Dawson of Penn and Lord Illingworth.

SCHOOL MEDICAL SERVICES.

The debate on the vote for the salaries and expenses of the Board of Education was opened on May 23rd by Lord EUSTACE PERCY, who spoke of the need for extending the scope and number of special schools and nursery schools. Mr. D. M. COWAN welcomed the establishment of an Educational Research Committee for Scotland, and Mr. JOHNSTON criticised the small amount of money spent in Scotland on the physical welfare of the child compared with that spent on education. Major ELLIOT spoke of the desirability of unification and amalgamation of health services, and promised to draw the attention of the Secretary of State for Scotland to the views of the Committee that greater attention should be paid to the physical condition of school-children.

HOUSE OF LORDS.

WEDNESDAY, APRIL 17TH.

LOCAL GOVERNMENT (SCOTLAND) BILL.

The Local Government (Scotland) Bill was considered on report.

Provisions Relating to or Consequent on Transfer of Functions.

On Clause 5 the Earl of ONSLOW (Paymaster-General) moved a drafting amendment to ensure that the section shall apply to a body such as the Royal Asylum of Montrose.

The amendment was agreed to.

The Earl of ONSLOW further moved after Subsection (2) to insert:—

> "Where in the constitution of any trust or other body whether corporate or not, provision is made for the appointment as trustees or members of the governing body of one or more members of a district board of control whose functions are by this Act transferred to two or more transferee authorities, the General Board of Control for Scotland may, after consultation with the trustees of governing body by order provide for the transferee authorities concerned jointly or a joint committee thereof or for the transferee authorities severally nominating trustees or members of the governing body in place of the members of the district board of control, and the constitution of the trust or other body shall have effect subject to the provisions of any such order."

He explained that this amendment was also designed to meet a case such as that of the Royal Asylum of Montrose where, under the constitution, the district board of control had a right to appoint representatives to the governing body. The district board would now disappear, and its functions were transferred to two separate authorities, the county councils of Angus and Kincardine. The amendment authorised the General Board of Control to provide that the appointment of these representatives should be made either by the two county councils jointly or by a joint committee; or so many appointments might be given to the one county council and so many to the other.

The amendment was agreed to.

Medical Officers of Health and Sanitary Inspectors.

Viscount YOUNGER OF LECKIE moved to leave out Clause 35, and to insert the following new clause:—

> "On a vacancy arising after the commencement of this Act in the office of medical officer of health or sanitary inspector of a small burgh, the medical officer of health or sanitary inspector, as the case may be, of the county within which the burgh is situated shall *ipso facto* become the medical officer of health or sanitary inspector for the burgh, and such proportion of the salaries and expenses of such officer as the county council and the town council may agree shall be paid by the town council to the county council, and, failing agreement, as may be determined by the Department of Health."

He said that his object was to introduce into the clause the post of sanitary inspector as well as the medical officer of health. It was very important that county sanitary inspectors in Scotland should in similar circumstances be always the sanitary inspectors of the small burghs. In that way they would get a much better official, a man of higher standing, of greater capacity, as well as a more independent man.

The Earl of ONSLOW said that the case in regard to the medical officer of health had been decided by their lordships, who had accepted the principle laid down in the Bill, but in regard to the sanitary inspector rather different considerations presented themselves. In some of the smaller burghs of Scotland at the present time only a very small sum was available for the payment of the sanitary inspector, and the consequence was that the sanitary inspector very often was a person who had not the qualifications which were laid down in Subsection (2) of the clause. The object of that was to ensure that all sanitary inspectors should be thoroughly qualified persons. In a burgh which had a sanitary inspector of its own, two sanitary inspectors would be concerned with the health services of the burgh. The county sanitary inspector would be concerned with the major sanitary services, and the burgh sanitary inspector would be concerned with the minor sanitary services, one being the matter of lodging-houses. It had been represented very strongly in Scotland by many of the smaller burghs, and it was eminently desirable that they should have a sanitary inspector to themselves, and those which had made this representation most strongly were the burghs which were seaside resorts. But if these burghs were to maintain sanitary inspectors they must be thoroughly qualified. If they could not afford to pay for such an official the burgh must come to an arrangement with the county. In all probability in such a case the county sanitary inspector would be appointed, but he did not say that it was absolutely necessary that he should be. He hoped that their lordships would accept the Bill as it stood in view of the strong feeling in the small burghs on the question.

The Earl of MAR AND KELLIE said that it was absolutely essential that the sanitary inspector should be a county official. The work of the medical officer and the sanitary inspector was interlaced and interwoven. They constantly had to carry out their duties together, and if they were appointed by two different authorities, and controlled by those authorities, there was bound to be friction. He hoped the Government would accept the amendment.

The Duke of BUCCLEUCH said he agreed with the noble earl who had just spoken that it was most essential for efficient administration that the amendment should be accepted. The health of the public throughout the county, including the burghs, should be the first consideration, and should come before any susceptibilities which might exist. It was perfectly well known that there had been cases in the past where the medical officer and the sanitary inspector had been at loggerheads, and the result had been, if not disastrous, at all events very unsatisfactory.

The Marquess of SALISBURY (Lord Privy Seal) agreed that it was of supreme importance that these sanitary services should be carried out by competent men. But that was provided by the Bill. No man was to be appointed henceforth who had not got a proper certificate. The sanitary inspector ought to be under the medical officer, but he would not be under him for all purposes even if Lord Younger's amendment was passed. In process of time probably those interested in Scottish legislation would see that the sanitary inspector was placed for all purposes under the medical officer of health. When that time came probably it would be a very good opportunity for the general reconsideration of the position. In the meantime the Government had met part of the difficulty.

The Earl of STAIR said he hoped that Lord Younger would press his amendment. The position of county councils was going to be difficult enough in taking over duties from different authorities without having to decide between existing sanitary inspectors in the smaller burghs. It was very desirable that there should be one sanitary inspector for the whole county.

On a division, Lord Younger's amendment was carried by 33 votes to 20.

The report stage of the Bill was concluded.

TUESDAY, APRIL 23RD.

Qualifications of Chemists.

Viscount GAGE, on behalf of Lord DESBOROUGH, introduced a Bill to enable the Council of the Pharmaceutical Society of Great Britain to make by-laws providing for the registration without examination of persons desiring to be registered as pharmaceutical chemists in Northern Ireland.

The Bill was read a first time.

HOUSE OF COMMONS.

WEDNESDAY, APRIL 17TH.

Small-pox on the s.s. "Tuscania."

Mr. JOHNSTON asked the Secretary of State for Scotland whether he was in a position to make any statement regarding the transfer of an engineer and of foodstuffs from the s.s. *Tuscania* to other ships at the port of Glasgow before the s.s. *Tuscania* was fumigated or disinfected after an outbreak of small-pox.—Sir J. GILMOUR replied: The s.s. *Tuscania* has been dealt with by the medical authorities of the Port of Glasgow in a manner authorised by the International Sanitary Convention of 1926, which was ratified by this country last year. Two engineers and some frozen fowls and frozen ducks were transferred from the *Tuscania* to the s.s. *Caledonia* before fumigation or disinfection had been carried out. The doctor and the purser of the *Caledonia* were notified that the engineers and foodstuffs were from the *Tuscania*. In terms of the International Sanitary Convention, the medical officer of health of Glasgow had no power to prevent the transfer to another vessel of the engineers, who were not suffering from small-pox, or of the foodstuffs, even if he had thought it desirable to do so. So far as is known, no other foodstuffs were transferred from the *Tuscania* to the *Caledonia* or any other ship. I am satisfied not only that the measures taken by the medical authorities of Glasgow are in accordance with the Convention, but also that they are all that could reasonably be done to prevent the spread of infection.

Vaccination Regulations at French Ports.

Mr. RAMSAY MACDONALD asked the Secretary of State for Foreign Affairs whether his attention had been drawn to the fact that all passengers from Great Britain, India, and certain other places were to be refused permission to land at French ports unless they could satisfy the French local medical officers of health that they had been vaccinated within the last two months; and whether he had any statement to make on the subject.—Sir AUSTEN CHAMBERLAIN replied: Immediately the new regulations were brought to their notice His Majesty's Government put themselves in communication with the French Government. I understand that the matter was considered this morning at a meeting of the Council of Ministers. Up to now I have received no official reply to the inquiries which I caused to be made, but the press this afternoon announce that at their meeting the Council of Ministers decided provisionally to suspend the Order and to arrange for a meeting between the French and English health authorities so that the two countries can act in common in taking whatever precautions may be deemed necessary. I am informed that the Southern Railway have issued a statement to the effect that vaccination certificates are not necessary for travellers to France.

THURSDAY, APRIL 18TH.

Sulphur Fumes from Electricity Plants.

Viscount SANDON asked the Minister of Transport whether he would immediately refer the question of the complete elimination of sulphur fumes from the workings of electricity generating plants to some body for scientific investigation and research; and whether, in the meantime, he would insist on sites for such purposes being chosen with full regard to the public interest, especially in the case of Battersea, in view of the effect of such fumes on the fabric of the Houses of Parliament.—Colonel W. ASHLEY replied: In approving sites for power stations regard is, of course, had to the public interest and opportunity is given for the hearing of any representations made, and no site in the County of London can be approved by the Electricity Commission without the consent of the Commissioners of Works unless the authority of Parliament has been obtained. When consent was given to the erection of the Battersea Power Station which is now under construction an obligation was placed upon the London Power Company to take the best known precautions for the due consumption of smoke, and for preventing, so far as reasonably practicable, the evolution of oxides of sulphur. I am assured by the Electricity Commissioners that in this modern power station effective steps can and will be taken to prevent the emission of grit and smoke. I am also informed that, with a view to compliance with their obligation, the company have been employing research chemists to work on the problem of the elimination of sulphur fumes, and have stated that satisfactory results have already been obtained in laboratory experiments. In view, however, of the public interests involved, the Electricity Commissioners, with my approval, have asked the Government chemist to examine these results and to keep in close touch with the progress of the company's investigation. In conjunction with the Department of Scientific and Industrial Research, he will advise the First Commissioner of Works and the Electricity Commissioners as to the efficiency of the measures proposed to be adopted to comply with the conditions on which consent has been given to the erection of the new station. The Ministers concerned with the various aspects of the question will remain in consultation with one another and watch it closely.

League of Nations and Radium Supplies.

Lieut.-Commander KENWORTHY asked the Prime Minister whether His Majesty's Government had under consideration proposals for international action through the League of Nations for the control of the available supplies of radium and their price; and, if not, whether any other proposals to this end were under consideration.—Mr. CHAMBERLAIN (Minister of Health) replied: As was stated in reply to Dr. Vernon Davies last Tuesday, the Government propose to establish an organisation, one of whose functions will be to act as an agency for the purchase of radium for medical use in this country or for Dominion or Colonial Governments. Until this organisation has been established and experience has shown how far it meets the needs of the situation, it would be premature to consider international action.

Lieut.-Commander KENWORTHY: As the question of international action is not dealt with in the Report, will the right hon. gentleman communicate with the Secretary of State for Foreign Affairs to see whether consultations can take place between the Governments concerned to prevent an unholy scramble for the available supply?

Mr. CHAMBERLAIN: I think it would be better to defer action on that point until we have this new organisation set up which I do not expect will take very long, and then perhaps we shall see.

Lieut.-Commander KENWORTHY: I do not cavil at what the right hon. gentleman says, but is he aware that the question of international action is not dealt with at all in the Report, and is that under the consideration of the Government?

Mr. CHAMBERLAIN: So far as I recollect, there is no question of international action mentioned in the Report of the Committee, but I think that the immediate question for this country is whether we can obtain the supplies that we require for ourselves at a reasonable price, and, as I understand, we have every reason to think that that can be done.

Dr. DAVIES: Can my right hon. friend say if we shall have a chance of discussing this Report before the House rises, particularly as the Government propose to spend pound for pound for the supply of this radium?

Mr. CHAMBERLAIN: There will have to be, I suppose, a Supplementary Estimate for the amount contributed by the Government, and I think that would give an opportunity for discussing the matter.

Replying to Mr. R. MORRISON, Mr. CHAMBERLAIN said that the Committee had now finished its labours.

Injurious Effects of Cream Preservatives.

Captain STREATFEILD asked the Minister of Health whether he had any evidence to show that illness or death had resulted from the use of preservatives in cream.—Mr. CHAMBERLAIN replied: There is evidence that individuals have suffered from digestive disorders after taking boracised cream, and there are cases on record where a single dose of borax has caused death. But, apart from the general objection to the use of preservatives in food as tending to mask the effects of dirty methods of production, the case against borax is that it is a cumulative and insidious chemical substance, the continued ingestion of which cannot fail to be injurious, in a greater or less degree, to the tissues of the body.

Hygienic Manufacture of Synthetic Cream.

Captain Streatfeild asked the Minister of Health whether his department had taken any steps to ensure that the manufacture of synthetic cream was carried out under the same conditions of hygiene as were imposed under the regulations governing the production of natural cream.—Mr. Chamberlain replied: I have not received any reports as to the conditions of manufacture of this article, but the provisions of Section 72 of the Public Health Act, 1925, should be sufficient to ensure the observance of all necessary sanitary precautions.

Mental Deficiency Committee's Report.

Lieut.-Commander Kenworthy asked the Minister of Health whether, having regard to the fact that local authorities would be submitting, as part of their schemes under the Local Government Act, their proposed arrangements for the care of mentally defective persons, he would take steps to see that the guidance which the report of the Joint Committee on Mental Deficiency would give to these local authorities should be made available for them without further delay.

Mr. Morris asked the Minister of Health whether he would state his decision in regard to the publication of that part of the report of the Special Committee on Mental Deficiency which related to adult defectives.

Mr. Robert Morrison asked the Minister of Health whether he was aware of the decision to publish the children's section of the report of the Mental Deficiency Committee; and, in view of the anxiety amongst those interested with regard to the section of the report dealing with adults, he would state the reason for the postponement of the decision to publish.—Mr. Chamberlain replied: I am not at present in a position to add anything to the previous replies in which I have indicated that I cannot give undertakings as to the publication of any part of this report other than that which relates to children until I have had an opportunity of giving proper consideration to the matter. I am afraid that other preoccupations have prevented that opportunity from occurring.

Mr. Morrison: In view of the fact that the conference of Poor-law Associations in connexion with this subject is to be held next week, will the right hon. gentleman consider the publication of the report, or at any rate the recommendations of the report.

Mr. Chamberlain: Clearly the recommendations are a vital part of the report. Until I have had an opportunity of considering this very long report, I cannot add anything to the answer I have given.

Mr. Pethick-Lawrence: Is it not a fact that the local authorities have to put part of this into force and to prepare schemes before September, and is it right that the right hon. gentleman should leave them so little time in which to have the report before them?

Mr. Chamberlain: There is a good deal of time between now and September, and I am not at all sure what effect on the liberty of the subject the report may have.

Mr. Morrison: Will the right hon. gentleman say definitely that the report will be published?

Mr. Chamberlain: No, I do not say that.

Dr. Vernon Davies: May we take it for granted that my right hon. friend will carefully study the report before arriving at a decision as to the schemes submitted by local authorities?

Mr. Chamberlain: Certainly.

Medical Officials on Local Authorities.

Sir Charles Trevelyan asked the Minister of Health whether, where the powers or duties of a board of guardians were transferred to a city or county council, a councillor who was holding a position such as that of doctor or public vaccinator under the transferred board would be compelled to resign his position as councillor if he was continued in his position under the new authority.—Mr. Chamberlain replied: I am advised that a person who, after April 1st, 1930, holds such a position as that of district medical officer or public vaccinator under a county or county borough council, will be disqualified from being a member of the council.

Dental Service in Welsh Schools.

Sir Robert Thomas asked the President of the Board of Education whether there were in Wales any entire counties or any other extensive areas, the education authorities of which provided no dental service in the schools; and, if so, whether he had any statistics of mortality, absenteeism, or other data showing how juvenile health in these counties compared with that prevailing in the counties which had a dental service.—Lord Eustace Percy replied: The three education authorities in Wales which at present make no provision for dental treatment are Cardiganshire, Carmarthen Borough, and Pembroke Borough. As regards the second part of the question, the hon. baronet will appreciate that the general health or mortality of school-children and their regularity of attendance at school are affected by a variety of causes, not readily separable.

Regulation of Nursing Homes.

Sir Robert Thomas asked the Minister of Health the number of private nursing homes in London, in the provinces, and in Wales, respectively; what were the regulations for the inspection and approval of these institutions by the local health authority prior to the admission of patients and subsequently; and how many inspections were carried out in each of the three groups mentioned above during the last 12 months to any convenient recent date.—Sir Kingsley Wood (Parliamentary Secretary to the Ministry of Health) replied: The Nursing Homes Registration Act, 1927, came into operation on July 1st, 1928. Medical officers of health have been asked to include statistics of homes registered under the Act in their annual reports for 1928, but these reports are not yet available. Premises within the scope of the Act are subject to the provisions of the Act and of by-laws made under it by local supervising authorities. These authorities are empowered to inspect nursing homes under Section 5 of the Act, but my right hon. friend has no detailed information as to their exercise of this power.

Small-pox on the s.s. "Tuscania."

Lieut.-Colonel Fremantle asked the Minister of Health the number of cases of small-pox that had occurred to date from the s.s. *Tuscania*; the number of these that had occurred since the official statement was issued on April 12th; the number that had died; the vaccination history of those who had died; whether any cases had occurred from contact with passengers or crew; and whether all passengers and crew were under observation and had been offered vaccination.—Mr. Chamberlain replied: The number of cases of small-pox which have occurred among the 1598 persons (passengers and crew) of the *Tuscania* is 45, which is ten more than the figure of 35 announced on April 13th. There have been seven deaths. The vaccination history of the patient who died, and of the other patients, is not yet available. All the patients notified have been isolated in hospital, and all the contacts are being kept under supervision. I have no information at present that any persons, other than those who were on board this ship, have contracted small-pox from contact with the passengers and crew. I am glad of this opportunity to say that the rigorous action which has been taken in this country to prevent the spread of small-pox from this vessel appears to have proved effectual. As the ship arrived here 17 days ago, any serious risk of a widespread outbreak of the disease should now be at an end, even though it is possible that some secondary cases may arise. It is scarcely necessary for me to add that for the community in general facilities are always available for free vaccination, which is the best safeguard against any risk of infection.

Lieut.-Colonel Fremantle asked whether the vaccination history of those who had died would be available in due course?

Mr. Chamberlain: Yes, Sir, I hope to be able to get it, and I will convey the information to my hon. and gallant friend.

Lieut.-Colonel Fremantle asked the Minister of Health the number of cases of small-pox that had occurred amongst passengers and crew of the s.s. *Mashobra*, shortly due at Southampton from Bombay; what number of passengers landed at Marseilles for England; and what steps were being taken to prevent the introduction of small-pox through them into this country.—Mr. Chamberlain replied: It is not yet known whether there has been any small-pox on board this vessel, but all precautions are being taken and she will be closely inspected at Plymouth, her first port of arrival. I am informed that 31 of her passengers were landed at Marseilles.

Small-pox in India.

Mr. Viant asked the Under Secretary of State for India what was the latest information in his possession in regard to the prevalence of small-pox in India.—Sir G. Hennessy, who replied, said: There is an epidemic of small-pox in Bombay City, where there were 233 cases and 130 deaths between Jan. 1st and Feb. 16th. There are no later official figures, but, according to a press report, the total number of deaths from Jan. 1st to March 18th was 368. In the whole of British India, between Jan. 1st and Feb. 16th, there were 19,529 cases and 4821 deaths, the case and mortality-rates being approximately the same as for 1928.

Vaccination and Visitors to France.

Lieut.-Colonel Fremantle asked the Secretary of State for Foreign Affairs if he had any information as to the requirements with regard to vaccination of visitors proceeding from this country to France; and what steps he was taking to help them conveniently to conform to these requirements.—Mr. LOCKER-LAMPSON (Under Secretary for Foreign Affairs) replied: Since my right hon. friend dealt with this matter yesterday official confirmation has been received of the suspension of the new French vaccination regulations. Discussions with the French Government are continuing.

Lieut.-Colonel FREMANTLE: Why is it that such action should have been taken when there are at least two international bodies that deal with health matters—one at Geneva and one at Paris?

The SPEAKER: That does not arise out of the right hon. gentleman's answer.

Poison Gas in War.

Mr. WILLIAM THORNE asked the Secretary of State for Foreign Affairs if he was aware that the German Reichstag had ratified the Geneva protocol prohibiting the use of poison gas in war; and whether the British Government had ratified the protocol.—Mr. LOCKER-LAMPSON replied: The proposal of the German Government to ratify the protocol was passed by the Reichstag on March 21st, but, so far as I am aware, Germany has not yet formally ratified. The answer to the second part of the question is in the negative.

MONDAY, APRIL 22ND.

Radium Supplies.

Mr. ROBERT MORRISON asked the Prime Minister when it was proposed to launch the public appeal for funds to purchase radium; and when the precise form of the organisation to be set up would be decided.—Sir KINGSLEY WOOD replied: The Government have no information as to the date of an appeal, though they hope it will be made in the near future. The precise form of the organisation recommended by the Radium Subcommittee, and accepted in principle by the Government, is already under discussion, and will, I hope, be settled in a very short time.

Mr. MORRISON asked whether the promised statement would be published before the General Election.

Sir KINGSLEY WOOD replied that he hoped it would be published within a few days.

Dr. VERNON DAVIES: Are we to understand that the Radium Trustees are already appointed and functioning?

No reply was given to this question.

Mr. MORRISON asked the Prime Minister whether the National Radium Trustees would have power to expend any of the funds in an endeavour to discover sources of supply independent of the Belgian company.—Sir KINGSLEY WOOD replied: No, Sir. The functions of the trustees as defined in paragraph 82 of the Radium Subcommittee's report will not extend to this purpose.

Insured Persons and Dental Treatment.

Mr. SHINWELL asked the Minister of Health whether he was aware that applicants for dental treatment who were members of approved societies in the London area were being inconvenienced through delays in dealing with their claims; and if he would inquire as to how far this was due to the methods employed by regional officers and take steps to expedite decisions in such cases.—Mr. CHAMBERLAIN replied: I am aware that owing to a large and rapid increase in the number of cases referred to the regional dental staff there have been some delays of the kind suggested. Steps have been taken to deal with the position, and a considerable improvement has already been effected, the clearance of references in London itself being now up to date.

Fumes from Artificial Silk Works.

Dr. VERNON DAVIES asked the Minister of Health whether he had received any reports from his inspectors regarding the emission of fumes from artificial silk works.—Sir KINGSLEY WOOD replied: Yes, Sir. The chief alkali inspector has made a report on this subject and my right hon. friend is arranging for its publication.

TUESDAY, APRIL 23RD.

Night Telephone Calls for Medical Men.

Mr. HORE-BELISHA asked the Postmaster-General whether his attention had been called to a coroner's criticism at a Surrey inquest of the telephone service, in which he stated that it was not the first case that had come before him where an urgent summons had been sent through to the telephone exchange during the night and no reply had been received; and what steps he intended to take to render the night telephone service efficient.

Mr. ROBERT MORRISON asked the Postmaster-General whether he had held an inquiry into the alleged failure of the night telephone service to which attention was drawn at a recent inquest at Croydon; and what was the result.

Sir ROBERT THOMAS asked the Postmaster-General whether he was aware that the father of a young man taken ill recently in the early hours of the morning attempted to telephone for a doctor, but failed to get a reply from the exchange although he tried for three-quarters of an hour; that the coroner subsequently stated that this was not the first case in his experience when the exchange made no reply to an urgent night summons; and whether he would make a general statement on the question of night staffs for telephone exchanges.—Sir W. MITCHELL-THOMSON replied: I have made full inquiry into this case, and greatly regret to find that there was a failure of the night telephone service on this occasion. It has not been possible to determine the precise cause of the failure, and I can find no record of a similar case in the same locality. A system of periodical testing has been for some time in force at night telephone exchanges, and the latest records show that the average speed of answer by the operators is satisfactory. I propose to extend this testing system further, and am at present considering the best means of so doing.

Mr. HORE-BELISHA asked if the Postmaster-General was not aware that there had been very considerable and almost universal dissatisfaction with this service for a long time, and if his attention had been called to the specific complaint made by doctors, notably by the hon. secretary of the blood transfusion section of the Red Cross Society, in which allegations had been made about loss of life owing to the delays in this service; and if he was doing anything to expedite inquiries?

Sir W. MITCHELL-THOMSON: I cannot say that I have an accurate recollection of that particular complaint, but I am aware of the fact that there have been complaints. That is the reason why these tests were made. The tests showed that the average speed of answers, taken all round, was not unsatisfactory.

First-aid Appliances at Collieries.

Mr. THOMAS WILLIAMS asked the Secretary for Mines when the new regulations relating to first-aid appliances, &c., at collieries were issued; and what steps his inspectors were taking to see that such regulations were being adhered to.—Commodore H. DOUGLAS KING replied: The first-aid regulations at present in force are those of July 10th, 1913, and their observance is checked by inspections at all the collieries. The proposed new regulations on this subject are being discussed with representative bodies of the industry, and have not yet been issued.

Mortality from Influenza.

Mr. MALONE asked the Minister of Health whether his attention had been drawn to the returns of the Registrar-General showing that in the first quarter of this year the deaths recorded exceeded the births by 24,105, the deaths for the most part being due to the influenza epidemic; whether he was aware that in the Midlands in the first week of March the death-rate from influenza alone, not including derivative diseases, reached the figure of 0·67 per 1000; and whether any research into this disease had been undertaken by the Medical Research Council during the past year or was being undertaken or contemplated by the Council at the present time.—Sir KINGSLEY WOOD replied: The returns issued by the Registrar-General show that in the first quarter of this year the deaths in 107 great towns in England and Wales exceeded the births by 25,108. The deaths numbered 111,003, influenza being certified as one of the causes of death in 12,711 cases. No similar figures are yet available for the country as a whole. The death-rate from influenza quoted in the second part of the question relates only to the great towns in the Midlands. As regards the last part of the question, I am informed that the Medical Research Council are actively promoting researches into the group of diseases to which influenza is believed to belong.

International Action in Health Measures.

Sir WALTER DE FRECE asked the Minister of Health whether there existed any international machinery, and, if so, of what nature, to enable the fullest prior exchange of views between the health authorities of different countries before, by any one country, a health or sanitary ordinance was issued against the subjects of another.—Sir KINGSLEY WOOD replied: The International Sanitary Convention of 1926 defines the measures that may be taken by countries which are parties to the Convention in order to prevent the introduction and spread of certain communicable diseases. The Convention does not require that there shall be an exchange of views between the countries concerned before the restrictions authorised by the Convention are imposed.

EVELINA HOSPITAL, SOUTHWARK.—An anonymous donor has promised to build and equip a convalescent home if the hospital can collect an endowment fund within three years. As soon as £10,000 is in hand the building will be begun.

objection to the use of preservatives in food as tending to mask the effects of dirty methods of production, the case against borax is that it is a cumulative and insidious chemical substance, the continued ingestion of which cannot fail to be injurious, in a greater or less degree, to the tissues of the body.

Hygienic Manufacture of Synthetic Cream.

Captain STREATFEILD asked the Minister of Health whether his department had taken any steps to ensure that the manufacture of synthetic cream was carried out under the same conditions of hygiene as were imposed under the regulations governing the production of natural cream.—Mr. CHAMBERLAIN replied : I have not received any reports as to the conditions of manufacture of this article, but the provisions of Section 72 of the Public Health Act, 1925, should be sufficient to ensure the observance of all necessary sanitary precautions.

Mental Deficiency Committee's Report.

Lieut.-Commander KENWORTHY asked the Minister of Health whether, having regard to the fact that local authorities would be submitting, as part of their schemes under the Local Government Act, their proposed arrangements for the care of mentally defective persons, he would take steps to see that the guidance which the report of the Joint Committee on Mental Deficiency would give to these local authorities should be made available for them without further delay.

Mr. MORRIS asked the Minister of Health whether he would state his decision in regard to the publication of that part of the report of the Special Committee on Mental Deficiency which related to adult defectives.

Mr. ROBERT MORRISON asked the Minister of Health whether he was aware of the decision to publish the children's section of the report of the Mental Deficiency Committee; and, in view of the anxiety amongst those interested with regard to the section of the report dealing with adults, he would state the reason for the postponement of the decision to publish.—Mr. CHAMBERLAIN replied : I am not at present in a position to add anything to the previous replies in which I have indicated that I cannot give undertakings as to the publication of any part of this report other than that which relates to children until I have had an opportunity of giving proper consideration to the matter. I am afraid that other preoccupations have prevented that opportunity from occurring.

Mr. MORRISON : In view of the fact that the conference of Poor-law Associations in connexion with this subject is to be held next week, will the right hon. gentleman consider the publication of the report, or at any rate the recommendations of the report.

Mr. CHAMBERLAIN : Clearly the recommendations are a vital part of the report. Until I have had an opportunity of considering this very long report, I cannot add anything to the answer I have given.

Mr. PETHICK-LAWRENCE : Is it not a fact that the local authorities have to put part of this into force and to prepare schemes before September, and is it right that the right hon. gentleman should leave them so little time in which to have the report before them ?

Mr. CHAMBERLAIN : There is a good deal of time between now and September, and I am not at all sure what effect on the liberty of the subject the report may have.

Mr. MORRISON : Will the right hon. gentleman say definitely that the report will be published ?

Mr. CHAMBERLAIN : No, I do not say that.

Dr. VERNON DAVIES : May we take it for granted that my right hon. friend will carefully study the report before arriving at a decision as to the schemes submitted by local authorities ?

Mr. CHAMBERLAIN : Certainly.

Medical Officials on Local Authorities.

Sir CHARLES TREVELYAN asked the Minister of Health whether, where the powers or duties of a board of guardians were transferred to a city or county council, a councillor who was holding a position such as that of doctor or public vaccinator under the transferred board would be compelled to resign his position as councillor if he was continued in his position under the new authority.—Mr. CHAMBERLAIN replied : I am advised that a person who, after April 1st, 1930, holds such a position as that of district medical officer or public vaccinator under a county or county borough council, will be disqualified from being a member of the council.

Dental Service in Welsh Schools.

Sir ROBERT THOMAS asked the President of the Board of Education whether there were in Wales any entire counties or any other extensive areas, the education authorities of which provided no dental service in the schools ; and, if so, whether he had any statistics of mortality, absenteeism, or other data showing how juvenile health in these counties compared with that prevailing in the counties which had a dental service.—Lord EUSTACE PERCY replied : The three education authorities in Wales which at present make no provision for dental treatment are Cardiganshire, Carmarthen Borough, and Pembroke Borough. As regards the second part of the question, the hon. baronet will appreciate that the general health or mortality of school-children and their regularity of attendance at school are affected by a variety of causes, not readily separable.

Regulation of Nursing Homes.

Sir ROBERT THOMAS asked the Minister of Health the number of private nursing homes in London, in the provinces, and in Wales, respectively ; what were the regulations for the inspection and approval of these institutions by the local health authority prior to the admission of patients and subsequently ; and how many inspections were carried out in each of the three groups mentioned above during the last 12 months to any convenient recent date.—Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) replied : The Nursing Homes Registration Act, 1927, came into operation on July 1st, 1928. Medical officers of health have been asked to include statistics of homes registered under the Act in their annual reports for 1928, but these reports are not yet available. Premises within the scope of the Act are subject to the provisions of the Act and of by-laws made under it by local supervising authorities. These authorities are empowered to inspect nursing homes under Section 5 of the Act, but my right hon. friend has no detailed information as to their exercise of this power.

Small-pox on the s.s. "Tuscania."

Lieut.-Colonel FREMANTLE asked the Minister of Health the number of cases of small-pox that had occurred to date from the s.s. *Tuscania* ; the number of these that had occurred since the official statement was issued on April 12th ; the number that had died ; the vaccination history of those who had died ; whether any cases had occurred from contact with passengers or crew ; and whether all passengers and crew were under observation and had been offered vaccination.—Mr. CHAMBERLAIN replied : The number of cases of small-pox which have occurred among the 1598 persons (passengers and crew) of the *Tuscania* is 45, which is ten more than the figure of 35 announced on April 13th. There have been seven deaths. The vaccination history of the patient who died, and of the other patients, is not yet available. All the patients notified have been isolated in hospital, and all the contacts are being kept under supervision. I have no information at present that any persons, other than those who were on board this ship, have contracted small-pox from contact with the passengers and crew. I am glad of this opportunity to say that the rigorous action which has been taken in this country to prevent the spread of small-pox from this vessel appears to have proved effectual. As the ship arrived here 17 days ago, any serious risk of a widespread outbreak of the disease should now be at an end, even though it is possible that some secondary cases may arise. It is scarcely necessary for me to add that for the community in general facilities are always available for free vaccination, which is the best safeguard against any risk of infection.

Lieut.-Colonel FREMANTLE asked whether the vaccination history of those who had died would be available in due course ?

Mr. CHAMBERLAIN : Yes, Sir, I hope to be able to get it, and I will convey the information to my hon. and gallant friend.

Lieut.-Colonel FREMANTLE asked the Minister of Health the number of cases of small-pox that had occurred amongst passengers and crew of the s.s. *Mashobra*, shortly due at Southampton from Bombay ; what number of passengers landed at Marseilles for England ; and what steps were being taken to prevent the introduction of small-pox through them into this country.—Mr. CHAMBERLAIN replied : It is not yet known whether there has been any small-pox on board this vessel, but all precautions are being taken and she will be closely inspected at Plymouth, her first port of arrival. I am informed that 31 of her passengers were landed at Marseilles.

Small-pox in India.

Mr. VIANT asked the Under Secretary of State for India what was the latest information in his possession in regard to the prevalence of small-pox in India.—Sir G. HENNESSY, who replied, said : There is an epidemic of small-pox in Bombay City, where there were 233 cases and 130 deaths between Jan. 1st and Feb. 16th. There are no later official figures, but, according to a press report, the total number of deaths from Jan. 1st to March 18th was 368. In the whole of British India, between Jan. 1st and Feb. 16th, there were 19,529 cases and 4821 deaths, the case and mortality-rates being approximately the same as for 1928.

Vaccination and Visitors to France.

Lieut.-Colonel FREMANTLE asked the Secretary of State for Foreign Affairs if he had any information as to the

Mr. Paul Bernard Roth has resigned his post as orthopædic surgeon to the London Homœopathic Hospital, while retaining his appointments elsewhere.

MANCHESTER AND DISTRICT RADIUM INSTITUTE.—During the past year this Institute's beds have been kept fully occupied, though owing to the greater length of the treatment the number of in-patients was only 374, as compared with 560 in 1927. The number of out-patients has risen to 7438, and there has been a marked increase in the demand for the radium treatment of cancer. The waiting-list has grown steadily, and treatment has had to be refused to many would-be patients. Dr. G. E. Birkett, honorary radiologist to the Institute, says in the annual report that concentration is being directed to the treatment of, and results of, carcinoma of the mouth and tongue. So far, during the last three years 250 cases of this type have been treated. Unless more radium is available, however, *further advances will not be made. Limited facilities are* the reason why so few cases of carcinoma of the breast have been dealt with. At the annual meeting on April 11th it was stated that, provided certain difficulties were overcome, in all probability there would in the near future be an amalgamation of the Institute with the Cancer Hospital, with a new hospital on a convenient site, complete with every modern convenience, and with a special annexe for the storage of radium and research work.

ROYAL MEDICAL BENEVOLENT FUND.—Sir Thomas Barlow, F.R.S., the President, took the chair at the ninety-third annual meeting of this Fund on April 18th. It was reported that the past year had been very successful, the number of new subscribers testifying to an awakened interest among members of the profession. The subscriptions and donations totalled £8623, compared with £7590 in 1927, the sum of £1667 being received as a result of the coöperation of the British Medical Association. Despite the increased income, however, the committee regrets that the amount of the grants made was often insufficient to meet the needs of the cases relieved. Thus the maximum annual grant that could be made to an entirely destitute widow was only £36, and appeals had often to be made to other charities to coöperate with the Fund in helping dependants of medical practitioners. Increased subscriptions and new subscribers were therefore needed, and for various reasons it would be a help to the Fund if subscribers would send their contributions during the first quarter of the year rather than later. The number of grants made in 1928 was 485, amounting to £8772, and many of the cases were very distressing. About £500 was spent on the education of orphans. A fair response was received to the appeal for contributions towards children's summer holidays, and 333 Christmas gifts were made, amounting in all to £500, together with £100 for coal. The sum paid in annuities was £4813, and owing to a legacy it had been possible to give six Alexander Lawrence annuities of £100 each. The number of annuitants of the Fund was 179. Among legacies received during the year was one of £5000 from the late Prof. Thelwall Thomas.

The officers of the Society elected for the coming year included Sir Thomas Barlow, President; Sir Charters Symonds, hon. treasurer; and Sir Percy Sargent and Mr. R. M. Handfield-Jones, hon. secretaries.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY, Burlington House, Piccadilly, W.

THURSDAY, May 2nd.—4 P.M., J. S. Haldane, W. Hancock, and A. G. R. Whitehouse: The Loss of Water and Salts though the Skin, and the corresponding Physiological Adjustments. Dr. F. H. A. Marshall and J. Hammond: Œstrus and Pseudo-Pregnancy in the Ferret. R. G. Canti and F. G. Spear: The Effect of Gamma Irradiation on Cell Division in Tissue Culture in vitro. (Communicated by Sir Frederick Andrewes. R. B. Bourdillon, C. Fischmann, R. G. C. Jenkins, and T. A. Webster: The Absorption Spectrum of Vitamin D. (Communicated by Dr. H. H. Dale.)—*The following papers will be read in title only:* G. E. Briggs: Experimental Researches on Vegetable Assimilation and Respiration. XX. (Communicated by F. F. Blackman.) R. J. Lythgoe and K. Tansley: The Relation of the Critical Frequency of Flicker to the Adaptation of the Eye. (Communicated by Sir John Parsons.) R. Hill: Reduced Hæmatin and Hæmochromogen. (Communicated by Sir Frederick Hopkins.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

WEDNESDAY, May 1st.—5 P.M., HISTORY OF MEDICINE: Annual General Meeting. Election of Officers and Council. Exhibit: Statuette of Imhotep, an ancient Egyptian deity of medicine, and a rare scarab associated with him: lent for exhibition by Dr. Hurry. Paper: Sir William Hale-White: The Letters of Dr. William Withering. 8.30 P.M., SURGERY. Annual General Meeting: Election of Officers and Council. SURGERY and MEDICINE to follow the Annual Meeting of the Section of Surgery. Discussion on the Indications for and the Results of Splenectomy. Openers: Mr. A. J. Walton (Surgery); and Dr. Hugh Thursfield (Medicine).

FRIDAY.—10.30 A.M., OTOLOGY. (Cases at 9.30 A.M.). Annual General Meeting: Election of Officers and Council. Subject for Discussion: The Treatment of Chronic Deafness. Short Papers: Dr. Dan McKenzie: The Symptomatic Treatment of Deafness. Mr. Harold Kisch: Chronic Deafness: its Treatment and Prevention. Mr. Thacker Neville: Chronic Deafness. Mr. G. Seccombe Hett and Mr. A. G. Wells: Ionisation as a Treatment for Middle-ear Suppuration. Cases and Specimens will be shown by Mr. Somerville Hastings, Mr. E. Watson-Williams, and others. 5 P.M., LARYNGOLOGY: (Cases at 4 P.M.). Annual General Meeting: Election of Officers and Council. Paper: Mr. F. J. Cleminson: Treatment of *Carcinoma of the* Œsophagus by Radium. Cases and Specimens will be shown by Mr. Somerville Hastings, Dr. D. R. Paterson, Mr. M. Vlasto Mr Frank Rose, Dr. P. Watson-Williams, and Mr. A. J. Wright. 8.30 P.M., ANÆSTHETICS. Annual General Meeting: Election of Officers and Council. Short Paper: Dr. H. Sington: Pre-medication by Paraldehyde in Children.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos-street, Cavendish-square, W.

FRIDAY, May 3rd.—8.30 P.M., Mr. Frank Kidd: Vasostomy and its Place in the Treatment of Early Urethritis. A Discussion will follow.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.

TUESDAY, April 30th.—5 P.M., Dr. F. M. R. Walshe: The Physiological Analysis of Some Clinically Observed *Disorders of Movement. (First Oliver-Sharpey Lecture).*

THURSDAY, May 2nd.—5 P.M. (Second Oliver-Sharpey Lecture).

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, April 29th, to SATURDAY, May 5th.—CITY OF LONDON HOSPITAL FOR DISEASES OF THE HEART AND LUNGS, Victoria Park, E. Tues., at 2 P.M., Dr. H. V. Morlock: The Early Infiltration and its Relation to the Development of Phthisis.—HAMPSTEAD GENERAL HOSPITAL, Haverstock Hill, N.W. Tues., 2.15 P.M., Mr. George Waugh (Wards).—The above are free.—LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE, Endsleigh-gardens, W.C. Tues. and Thurs., 2 P.M., Lecture-demonstration.—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E., Special Course in Medicine, Surgery and Gynæcology.—ROYAL FREE HOSPITAL, Gray's Inn-road, W.C., Wed., Demonstration on Electrotherapeutic Methods and Apparatus.—WEST END HOSPITAL FOR NERVOUS DISEASES, 73, Welbeck-street, W.—Daily Lecture-demonstrations illustrated by cases at 5 P.M.—MAUDSLEY HOSPITAL, Denmark Hill, S.E., Four weeks special course in Psychological Medicine.—CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn road, W.C., Intensive Course.—Further particulars from the Fellowship of Medicine.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

MONDAY, April 29th.—10 A.M., Dr. Dowling: Skin Department. 2 P.M., Mr. Donald Armour: Operations. 2 P.M., Dr. Ironside: Medical Out-patients.

TUESDAY.—10 A.M., Medical Registrar: Ward Visit. 2 P.M., Mr. Addison, Operations. 2 P.M., Mr. Sinclair: Surgical Out-patients.

WEDNESDAY, May 1st.—10 A.M., Dr. Owen: Children's Out-patient Department. 2 P.M., Mr. Tyrrell Gray: Operations. 2 P.M., Dr. Scott Pinchin: Medical Out-patients.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 11.30 A.M., Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. MacDonald: Genito-Urinary Out-patient Department.

FRIDAY.—10 A.M., Dr. Pritchard: Medical Ward Visit. 12 noon, Dr. Shaw: Clinical Demonstration. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Children's Medical Out-patient Department. 10 A.M., Resident Assistant Surgeon: Ward Visit. Medical and Surgical Out-patients at 2 P.M., daily. Operations. Special Departments daily 10 A.M., to 5 P.M., Saturdays, 10 A.M. to 1 P.M. Special Classes in Anæsthetics and Operative Surgery.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, April 29th.—2.30 to 5 P.M.: Medical, Surgical, and *Gynæcological Clinics. Operations.*

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat and Ear Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.

UNIVERSITY COLLEGE, Gower-street, London.

MONDAY, April 29th, and the following TUESDAY and WEDNESDAY.—5.15 P.M., Prof. E. Mellanby: Drug-like Actions of Some Food Constituents. (Public Lectures).

THURSDAY, May 2nd.—5 P.M., Mr. R. J. Lythgoe: Special Sense Physiology. (First of six lectures.)

FRIDAY.—4 P.M., Prof. A. J. Hall: Some of the Sequels of Epidemic Encephalitis (Lethargica). (First of two public lectures.)

ST. THOMAS'S HOSPITAL, Albert Embankment, Westminster Bridge, S.E.

THURSDAY, May 2nd.—5 P.M., Prof. S. J. Cowell: Dietetics. (First of six lectures.)

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

WEDNESDAY, May 1st.—3.15 P.M., (at the Royal Chest Hospital, City-road), Dr. F. E. Saxby Willis: Thoracic Pain.

ROYAL DENTAL HOSPITAL POST-GRADUATE LECTURES.

WEDNESDAY, May 1st.—6 P.M., Dr. E. W. Fish: The Reaction of the Pulp and Dentine to Dental Caries.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

THURSDAY, May 2nd.—5 P.M., Dr. A. M. H. Gray: The Sacroids and Lupus Pernio.

FRIDAY.—5 P.M., Dr. A. C. Roxburgh: Differential Diagnosis of Some Common Skin Diseases.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, April 30th.—4.15 P.M., Mr. J. Morley: The Pain Associated with Gall-stones.

FRIDAY, May 3rd.—4.15 P.M., Dr. E. B. Leech: Demonstration of Medical Cases.

ANCOATS HOSPITAL POST-GRADUATE LECTURES, Mill-street, Manchester.

THURSDAY, May 2nd.—4.15 P.M., Mr. E. E. Hughes: Pyelitis.

Appointments.

DUNSCOMBE, N. D., M.B., B.Chir. Camb., D.P.H., has been appointed Medical Officer of Health, Bexhill.

FERGUSON, J., M.B., B.Ch. R.U.I., D.P.H., County Medical Officer of Health for Surrey.

Certifying Surgeons under the Factory and Workshop Acts: ANDERSON, H. P., M.B., Ch.B. Edin. (Kinross); SUTHERLAND, T. R., L.R.C.P. Lond., M.R.C.S. (Tredegar); TULLIS, G. D. E., M.B., Ch.B. Edin. (Hereford); and WHITBY, J. M. F., L.M.S.S.A. Lond. (Littleport, Cambs.)

Vacancies.

For further information refer to the advertisement columns.

Ashton-under-Lyne, District Infirmary.—H.S. At rate of £150.

Bedford County Hospital.—Asst. H.S. At rate of £130.

Bedfordshire Sanatorium, near Bedford.—Res. Asst. M.O. £450.

Birkenhead County Borough.—Asst. M.O. £450.

Birmingham, City Mental Hospital.—Jun. Asst. M.O. £350.

Birmingham and Midland Eye Hospital, Church-street.—Surgical Registrar.

Blackburn and East Lancashire Royal Infirmary.—4th H.S. At rate of £130.

Bolingbroke Hospital, Wandsworth Common, S.W.—Clin. Asst. to Ear, Nose and Throat Dept. £75.

Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.

Brighton, Sussex Eye Hospital.—Hon. Consulting Physician and Neurologist. Hon. Consulting Rhinologist. Also Hon. Consulting Dentist.

Bristol Education Committee.—Asst. School M.O. £600.

Bristol Royal Infirmary.—Hon. Med. Reg. Also Hon. Reg. to Ear, Nose and Throat Dept.

Bristol University.—Chair of Physiology.

Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.

Canterbury, Kent and Canterbury Hospital.—Two Res. M.O.'s Each £125.

Cardiff, King Edward VII. Welsh National Memorial Association.—Area Asst. Tuber. Physician. £600.

Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—Second Res. H.S. £75.

City of London Maternity Hospital, City-road, E.C.—Asst. Obstetric Surgeon.

Colchester, Essex County Hospital.—Asst. H.S. and Registrar. £120.

Derby Guardians' Institution and Infirmary.—Second Res. M.O. £250.

East Ham County Borough.—Asst. M.O. £600.

East London Hospital for Children, &c., Shadwell, E.—Res. H.S. Also Res. Cas. O. Each at rate of £125.

Edinburgh Royal Infirmary.—Hon. Clinical Assistants.

Folkestone, Borough of.—Asst. M.O.H. £600.

Glasgow, Victoria Infirmary.—Superintendent. £1000.

Guildford, Royal Surrey County Hospital.—H.S. At rate of £150.

Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.P. At rate of £100.

Hull Royal Infirmary.—Cas. H.S. At rate of £130.

Kingston-upon-Hull City and County of.—Asst. M.O.H. £600.

Leeds Public Dispensary.—Sen. Res. M.O. £200.

Leeds, Tuberculosis Sanatorium, Killingbeck.—Asst. Res. M.O. £250.

Liverpool Port Sanitary Authority.—Asst. Port M.O. £700.

London Hospital, Whitechapel, E.—Gynæcological First Asst. and Obstetric Tutor. £300.

London Female Lock Hospital, Harrow-road, W.—Hon. Obstet. Surg.

London Homœopathic Hospital, Great Ormond-street, and Queen-square, Bloomsbury, W.C.—Res. M.O. £100.

London Temperance Hospital, Hampstead-road, N.W.—Surg. Reg. 40 guineas.

Manchester Royal Infirmary.—First Asst. in Clinical Laboratory £350. Also Dickinson Research Travelling Scholarship in Medicine. £300. Also Pathology Scholarship. £75.

New End Hospital, Hampstead, N.W.—Jun. Res. Asst. M.O. At rate of £200.

Norwich City Mental Hospital.—Jun. Asst. M.O. £500.

Norwich, Norfolk and Norwich Hospital.—H.P. Also Cas. O and H.S. Each £120.

Nottingham General Hospital.—Res. Cas. O. At rate of £200.

Plumstead and District Hospital, Plumstead High-street, S.E.—Third Asst. M.O. £300.

Royal Army Medical College, Grosvenor-road, S.W.—Parkes Memorial Prize. £75. Also Alexander Memorial Prize. £50.

Royal Chest Hospital, City-road, E.C.—Res. M.O. At rate of £150. Also H.P. At rate of £100.

Royal Eye Hospital, St. George's-circus, Southwark, S.E.—H.S. Also Asst. H.S. At rate of £150 and £100 respectively.

Royal Free Hospital, Gray's Inn-road, W.C.—Asst. Morbid Anatomist and Curator of Museum. £300.

Royal London Ophthalmic Hospital, City-road, E.C.—Out-patient Officer. £100.

Royal National Orthopædic Hospital, 234, Great Portland-street, W. Surgical Registrar. At rate of £105.

St. Bartholomew's Medical College.—Senior Curator of Museum.

St. Helens County Borough.—Asst. M.O.H. £450.

St. John's Hospital, Lewisham, S.E.—Sen. Res. M.O. £250.

Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. At rate of £100.

University of London.—University Chair of Anatomy. £1000.

Wakefield, Clayton Hospital.—H.S. £150.

Walsall General Hospital.—Jun. H.S. At rate of £100. Also H.S. At rate of £125.

Wolverhampton, Royal Hospital.—Res. M.O. At rate of £150.

Wolverhampton and Midland Counties Eye Infirmary.—H.S. £200.

Woolwich and District War Memorial Hospital, Shooters' Hill, S.E.—H.S. At rate of £125.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Tipton (Staffs), and Leeds North (Yorks.).

Births, Marriages, and Deaths.

BIRTHS.

GARROW.—On April 19th, at Fernbrae, Dundee, the wife of Dr. R. P. Garrow, Great North-road, Highgate, N., of a son.

HORDER.—On April 20th, at Ben-Lui, Boyne-park, Tunbridge Wells, the wife of Cecil A. Horder, M.B., F.R.C.S., of a son.

NEWNHAM.—On April 17th, at a nursing home, Crayford, Kent, the wife of Dr. F. M. Newnham, of a son.

PAYNE.—On April 16th, the wife of Reginald T. Payne, F.R.C.S., of Abbey Court, St. John's Wood, of a son.

SELOUS.—On April 16th, at Tunbridge Wells, the wife of Cuthbert F. Selous, M.B., of a son.

TINCKER.—On April 17th, at Painswick, Glos., the wife of Surgeon-Lieutenant R. W. Holden Tincker, R.N.V.R., of a daughter.

MARRIAGES.

HOLLINS—STADDON.—On April 16th, at St. John's Church, Ipswich, Arthur Sturgess Hollins, B.A., M.R.C.P., of Thames Ditton, to Joan Staddon, M.R.C.S., of Ipswich.

SUMMERS—BATES.—On April 16th, at SS. Nicholas and Faith Church, Saltash, Ralph Donald Summers, L.R.C.P., M.R.C.S., to Florence Mathilde, daughter of Mr. and Mrs. W. Bates, of Port View, Saltash.

DEATHS.

AHRENS.—On April 16th, Henry Augustus Ahrens, M.R.C.S., L.R.C.P., late Surgeon-Major, Hants Carabineers, of Grangethorpe Hospital, Manchester, aged 59 years.

BRADNACK.—On April 21st, 1929, Gerald A. A. Bradnack, M.R.C.S., L.R.C.P., beloved husband of Nora Winifred Bradnack, M.B., B.S. (née Kirk). At Barton-on-Humber. Aged 33.

CAPON.—On April 20th, the beloved wife for 50 years of Herbert J. Capon, M.D., at Pine View, Sonning Common, Reading.

DAWES.—On April 18th, Joseph William Dawes, M.B., C.M., of Denbigh House, Longton, aged 65 years.

FARRAR.—On April 17th, at Hillmorton Paddox, Rugby, John Frederick Farrar, M.R.C.S. Eng., L.R.C.P. Lond., late of Putney, aged 74.

LAWRENCE.—On April 15th, at Hoath Cottage, Hadlow, Kent, Dr. H. M. Lawrence, aged 84.

RUTHERFURD.—At 20, Bute-gardens, Glasgow, W.2, on 14th April, 1929, Henry Rutherfurd, M.A., M.B., C.M., F.R.F.P.S.G.

SCHOFIELD.—On April 20th, at Bursleden Hotel, East Cliff, Bournemouth, Alfred Taylor Schofield, M.D., M.R.C.S., late of Harley-street, in his 83rd year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

SMALL-POX DIAGNOSIS.

BY W. MCCONNEL WANKLYN, B.A. CAMB.,
M.R.C.S. ENG., D.P.H.

WHEN by the Act of 1898 Parliament in its wisdom virtually *made vaccination optional, and confirmed that* measure by the Act of 1907, the people of this country in effect elected to discontinue protecting themselves against small-pox by the method of each member of the community rendering himself individually immune. Without realising it, they decided to substitute another method of protection—namely, the formation of an elaborate and efficient organisation for the purpose in the first place of instantly recognising small-pox, and then of rapidly suppressing it. *The cutting edge of this organisation is the accurate diagnosis of small-pox, which the administrative measures follow.* It is clear that everything turns on the sharpness of this cutting edge.

A Certain Means of Recognising Small-pox.

Happily for the country, before its renunciation of general vaccination, material for the new method of protection had been *in preparation owing to the work of the late Dr. T. F. Ricketts, which began in 1891. During this decade he* forged against small-pox a weapon happily described by himself as "the brand Excalibur"; it was a rapid and certain *means of recognising small-pox*, with the outstanding merit that it was readily capable of being communicated to others. Although finished skill in the use of this, as of any other weapon, can only come from natural talent or long training, it is a fact that by its use cases of small-pox have *even* been recognised on the first day of the rash by members of the medical profession who had never previously seen a case of the disease. It is something for which humanity may be thankful that one of the worst of infectious plagues betrays *itself early by a characteristic skin eruption* which it is not—*to use the phrasing of the National Insurance Act*—beyond the ability of the practitioner of ordinary competence and skill to discover.

Tested on a large scale in 1902, the method of Ricketts enabled all but two of 8000 cases certified as small-pox to be correctly classified: of cases so examined, about 600 were pronounced to be not small-pox *and 7400 to be* small-pox. This was done rapidly and at high pressure, by members of a team, several of whom had had no previous knowledge of the disease. In the 600 non-small-pox cases the diagnosis proved right every time; of the 7400 cases pronounced to be small-pox, subsequent observation showed that two only were not small-pox—an error on the whole of one-fortieth of 1 per cent.

The Voluntary Service Fund.

It remained to make universally known such an invaluable method of recognising and defeating small-pox: and, accordingly, a campaign *with that object* has been steadily carried on during the past 28 years, with increasingly good effect. At first conducted by private individuals, this has latterly been shared by a group of voluntary workers, professional and lay, who form a nucleus known as "the Voluntary Service Fund," one of whose functions is to assist in freeing the country from small-pox. Among the main principles which actuate the Fund this comes first; that *by far the strongest defence against* small-pox is to attack it: *not to wait for small-pox to* attack us, and then to defend ourselves against it, but for ourselves to attack small-pox first, and to clear it out of the country. That is its first line of policy. Its second is educational—namely, to make the simple principles of small-pox diagnosis well known, not merely to every physician and medical officer *throughout the country*, but to every medical student, nurse, inspector, and intelligent layman as well. Those principles are as readily comprehended as the characters of chicken-pox. Dr. Ricketts, when called on to proceed to a case 14 miles away, used to say, "Of course, I am going up to see this case and to settle its diagnosis, but really it is not necessary. It is perfectly certain from Nurse ——'s *description* that the case is chicken-pox." Such a report has *often been made to myself. Modern methods* of small-pox diagnosis are now spreading steadily among all classes of the population: on one recent occasion the mistress of the house, in which a case of small-pox had occurred, who had gained her information from a well-known book on household medicine, was perfectly correct in her belief that she had *before her a case* of that disease.

The Fund (present address, 64, Great Portland-street, W. 1) has spared no efforts to continue the propagation of the ground-work *principles of modern methods* of small-pox diagnosis. It has met the increasing demand for handy and easily assimilated information on the subject by the publication of "The Accurate Diagnosis of Small-pox" *(third edition, 1927, 6d.), convenient for carrying in the* pocket. *Public authorities, such as counties, boroughs*, guardians, institutions, steamship companies and others, to the number of some hundreds, have distributed this post-graduate address to their respective medical officers.

Value of this Service.

Uniformly good reports have come in as to the value of this service, which has been found to meet the following indications:—

1. Medical practitioners have been forewarned and forearmed.

2. By these two simple measures 50 per cent. of the risk *of a* small-pox outbreak has been removed from a district, *and that at a cost which is negligible* in proportion to the risks involved. A warning is not enough. It is imperative also to forearm those who are warned. Experience shows that nearly every single small-pox outbreak in this country is due to one of the medical sentries, upon whom has been thrown the onerous duty of watching for small-pox, being outwitted *by this cunning invader.*

3. Medical practitioners are grateful for this counsel and help. It takes some of the weight off their shoulders; it enables *them to diagnose* with ease many of the simpler cases to which they may be called wherein small-pox is in question; it strengthens their position and that of the medical officer of health; it keeps the whole line of defence in touch and alert.

4. Local authorities are placed in a better position to meet public criticism as to the adequacy of their preparations beforehand against small-pox. When small-pox breaks out in a district it is noticed that public opinion asks more insistent questions than it used to ask, simply because it is better informed. To equip in this manner the whole line of medical sentries, and to keep them equipped, is the very first step in preventive preparation.

Our country stands in a very singular position in regard to small-pox. When it is realised that it is no uncommon event for one million cases to occur in any one year in the world at large (in 1918 there were 93,000 deaths from small-pox in *British India alone) that infection from* one or other of the innumerable foci is continually hammering at our doors: that on its arrival it finds 30 millions of people in England and Wales liable to take small-pox, the risks which we are daily running may be seen to be colossal. *There is nothing whatever standing between our people* and a small-pox catastrophe but the eternal vigilance of the medical profession.

About 12,000 of its members have been reached so far by the distribution of the pamphlets on diagnosis already mentioned. *So far* small-pox has not been noted to take hold in an area in which they have been widely issued. It is a fair inference that when all practitioners throughout the country have been so reached, one step at least will have been *taken on the way towards checkmating the entry* of small-pox and *raising our* security against its attack.

The Method in Brief.

There is here added, in brief, the method of diagnosis, commonly used by myself, stated imperatively for better *effect.*

Always carry the question in mind, "Can this be small-pox?", in any of its 50 or more *disguises*. Can it be *small-pox in its* pre-eruptive stage, simulating influenza, rheumatism, appendicitis? Can it be an initial rash? Can it be *hæmorrhagic small-pox?* Or small-pox in the stage of papule, of vesicle, of pustule, of crust, of recent *scarring?* Secure the very best light available. Examine the whole skin as comprehensively as possible. Postpone questions. Reply on personal first-hand observation. Set *little store by comparatively valueless evidence*, such as "shottiness," "umbilication," "cropping." Take a *rapid observation* of the whole case.

Then 1. Examine the relative distribution of the lesions. Go over *the whole surface methodically.* Assign a high value *to this head of evidence. Compare especially* the relative incidence as between face and front of trunk. Note the hands, *all the flexor surfaces, the axillæ, the feet.* Recall that a small-pox rash usually favours the relatively hyperæmic surfaces, and shuns the relatively protected surfaces, which *are not necessarily the same in a* footpad and a baby, in a *scrubber and a lady of affluence.* Before you give up, dot in the spots on a diagram of the figure, and count the spots of a discrete case. This heightens accuracy of observation, is an invaluable report and a convincing record. *Having done this, and* weighed up the value of the evidence, *dismiss it temporarily* from mind, and begin over again with

T[illegible]ty of the *lesions.* Avoid the face at [illegible] protected area, such as the arm or [illegible] likely to be more typical. Ex[illegible] the lesions on the chest and flanks. Also those on the specially irritated surfaces, as on the feet. Estimate the depth of the spots in the skin by rolling a fold of it between finger and thumb. Note the evenness and definition, or otherwise, of the outlines of the lesions; whether they are circular or not; whether they are tense or not; whether the covering envelope is substantial or not. Note this also in dealing with the milder form of small-pox. The individual lesions of small-pox may vary much in size, and be excessively minute. There occur cases in which the rash might be described as having been reduced to a miniature; but it is small-pox all the same. Presumed chicken-pox, or any rash of the first or second day should always be kept under further observation.

3. Try to estimate whether, and how rapidly, the rash has matured: that of small-pox undergoes regular development. Even at one observation it is usually possible to gain evidence of this. This evidence may be invaluable when it is otherwise difficult to reach a conclusion and no second opinion is at hand. Then place the case in observation and such isolation as is desirable; watch its development. Of itself, that may tell the whole tale.

4. Once more, start afresh. Examine the previous course of the case. Keenly sift the grain of the evidence from the chaff. Throw the latter to the wind. In estimating the value of this "history," the first in point of time, often the last in value, bear in mind the relative proportion between the stress of the onset and the quantity of the eruption.

These are the four cardinal heads under which to cross-examine a rash. Other points of varying value are the state of vaccination, and the degree of exposure to infection. This above all. Weigh the *whole* of the evidence taken together, and with the diagram. If necessary take time to consider it. Take a walk or a day to settle a decision sometimes as puzzling and as momentous as any in medicine. Keep your notes. Sign them. A useful practice is to write out a short memorandum, for personal reference, beginning, "My reasons for this decision are . . . ." Few cases of small-pox can elude scrutiny on these lines.

THE FUTURE OF MEDICAL PRACTICE.

To the Editor of THE LANCET.

SIR,—Your leading article of Jan. 5th and letters in your issues of Jan. 19th and Feb. 2nd assume only two possible organisations when looking to the future of medicine—a State service and private practice combined with the voluntary hospital system. I suggest that neither of these plans holds out much hope for the profession.

The Government (i.e., Civil Service) have tried to manage the mines and railways in the past, and have failed. Medical men who single-handed have had to deal on medical matters with the Ministry of Health or other Government departments are convinced that a State medical service is also doomed to failure.

The voluntary hospitals of the past have a wonderful record of service to the necessitous poor: they have long ceased to confine their attentions to this section of the community and to-day spend their time collecting money by wide advertisement, competitions, and other not too scrupulous methods, and at the same time compete more and more openly with the profession in taking money from those able to pay for sick attendance. The profession might be well advised gradually to withdraw their support from the voluntary hospitals. In passing it may be added that county and borough councils with their increasing number of clinics—widely advertised and supported by the rates—are competing very unfairly with private practice. It requires a united and strong profession to confine them to their proper sphere of preventive medicine.

In the scheme which follows the medical profession would control and manage their own industry. The general practitioner would be, as your leading article hopes, the backbone or keystone of the scheme. Let the country be divided into suitable areas—smaller in towns, larger in the country. The medical practitioners of each area would combine to elect a staff of consulting surgeons, physicians, oculist, aurist, and the rest. These consultants should live in their area and foster medical science there; the general practitioners would guarantee them the consulting work of the area, and in return control their public and charity appointments. A central group of consulting-rooms, operating-theatre, laboratories, X ray room, &c., with an attached nursing home would immediately be put up in each area, and later special clinics could be built for child welfare and the like, or a large hospital as the demand arose. In suitable cases the profession could take over voluntary or other hospitals already in use.

How should this be done? It is useless to expect busy practitioners to attend meetings, but in each area they could subscribe towards the part or whole time salary of a medical secretary, whose duty it would be to visit and get to know all the doctors, and in a year or so formulate a definite scheme for his area to adopt. The area secretaries should also be responsible to a controlling director chosen by the profession who would impart the necessary cohesion to the area schemes. A new branch of medical administrators would have to be trained at the various medical schools; by their sympathy and medical knowledge this group would help materially in the success of any hospitals or other undertakings started by the profession.

Finance.—A loan or debenture could be floated on the London market to finance all capital outlay required by the schemes of each area, the security being the buildings it is proposed to erect or take over and a first charge on the profits of the undertaking. Interest on the issue to be at a fixed rate. All doctors to hold a stated amount of stock, so that they may have a financial interest and stake in the success of their hospitals. The banks could be approached for loans in the early stages to secure running expenses.

Insurance.—A scheme of insurance for all salaried people and their families should be adopted, which those in a small way of business could contract into. Provided the insurance companies remembered that their first duty was to help and pay out, the scheme should prove adequate and reasonable for all sickness and accidents. Payment, whether to patients or direct to doctor, should be on a piece-work basis, and contract practice should be reduced to a minimum. All others could be treated on financial lines such as those in vogue at the Mayo Clinic.

On this plan I believe that a busy but not overworked life could be built up for all medical men and women, giving a fair return for labour done. Also we could control both the number and type of students entering the different medical schools, and gradually build up a profession of which medical men and the nation generally could be justly proud.

I am, Sir, yours faithfully,

FORWARD.

THE INCORPORATED CHIROPODIST.

MEMBERS of the Incorporated Society of Chiropodists and their friends sat down, to the number of about 180, to dinner at the Café Royal on the evening of Saturday, April 20th, the medical profession being represented not only by the Rev. A. W. Oxford, treasurer and one of the founders of the Society, but also by several well-known orthopædic surgeons and others interested in certain aspects of chiropody. The President of the Society, Mr. W. H. Taylor, in replying to a toast proposed by the Mayor of Croydon, spoke of the increasing prestige and position of the Society, which now had its own hospitals in London, Liverpool, Manchester, and Edinburgh, and was soon likely to have centres in other populous districts. The London Foot Hospital in Charlotte-street, W. 1 is already, it seems, outgrowing its premises and is likely to reopen with more endowed "chairs" elsewhere in a few months' time. In responding for this hospital, Sir Henry McMahon, its chairman, put in a claim for its benefaction by the bootmakers who were responsible for most of the ills which the chiropodist was called upon to alleviate. Dr. Oxford had genially described the bootmaker as an Attila leaving a trail of misery and pain behind him on his triumphant march. Sir Edward Penton, who accepted his description as the "big noise in the boot industry," took up the challenge and spoke with pride for the bootmakers who had been the creators of chiropody and hoped finally to be its death. Allusion was made in the course of the evening to the Registration Bill which has been read a first time in the House of Lords. It does not, as was at first intended, attempt to close the profession by penalising the unqualified person, nor does it claim for the registered chiropodist the right of diagnosing maladies of the foot. But it does prescribe a standard of training and equipment which has facilitated the convention reached with the consulting medical officers of foot hospitals. This rests on the limitation of the chiropodist's knife to the structures superficial to the true dermis and on his undertaking to practise his craft with antiseptic precautions.

SUCCESS OF CONTRIBUTORY SCHEMES.—Reports of the progress of hospital contributory schemes form a record of all-round success. The Torbay scheme was formed at the beginning of April, and in the first fortnight more than 3000 members joined. In five months the Southampton and District Hospitals Association numbers 10,000 members. The Radcliffe Infirmary (Oxford) scheme now has 70,000 members, and last year £31,000 was collected. Its federated hospitals and societies number 16 in towns, 346 in villages, 400 in firms and factories, 25 in colleges and halls, and 12 in Oxford city parishes. The Harwich Hospital scheme has added 653 to its membership during the past year; the basis is 3*d.* per week for families with incomes under £350.

An Address

ON THE

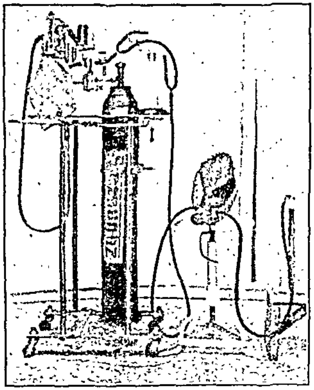
SURGERY OF THE ŒSOPHAGUS AND LUNGS.

Delivered before the Hunterian Society on Jan. 14th

BY DR. J. H. ZAAIJER,
PROFESSOR OF SURGERY IN THE UNIVERSITY OF LEYDEN.

THE subject I have chosen for this lecture is the experience we have had at the University of Leyden in the surgery of the œsophagus and lung, and the results we have obtained in this branch of work. When we began in 1909 we were strongly influenced by the work of Sauerbruch, and we were convinced that no real intrathoracic surgery could be performed without *differential* pressure apparatus. The feeling that positive or negative pressure *anæsthesia* apparatus was essential has more or less acted as a brake on the process of development of intrathoracic surgery, for those apparatus were expensive and difficult to handle. Its necessity led American workers to produce very costly but very magnificent positive and negative pressure chambers. In Leyden, however, we felt sure from the outset that such complicated apparatus was not necessary, and we therefore constructed a very simple positive pressure apparatus with which we were able to commence surgical procedures within the thorax. The engineer-constructor of one of the New York chambers once visited my clinic; when he saw our apparatus and heard our results he characterised the mechanism as "shamefully simple"!

FIG. 1.



Our outfit consists (Fig. 1) of the well-known Roth-Dræger apparatus for oxygen-ether and chloroform anæsthesia. On that is mounted a valve which directs the stream of oxygen through the pressure apparatus. A rubber tube divides into two channels, one passing through an ether bottle and the other going directly to the face-piece. The amount of oxygen passing through the ether is regulated by two simple pressure screws. The face mask is provided with a rubber edge and is held to the face by hand. We added a rubber balloon with a safety net round it in the belief that rather a high pressure would be necessary from time to time. From the mask the air passes through a rubber tube into a water ventilation chamber, wherein the pressure under which expiration takes place can be regulated. With this simple apparatus we have performed intrathoracic resection of the œsophagus with both pleural cavities open. So experience proved us right.

It is a curious thing that very different opinions are held about the value of differential pressure in thoracic surgery and the way to apply it. In France many surgeons think such an apparatus entirely superfluous. In America and in England surgeons and anæsthetists, such as F. P. de Caux, W. H. Romanis, P. H. Mitchiner, and Tudor Edwards think that the right way to apply the principle of differential pressure is by intratracheal insufflation, as introduced by Melzer and Auer in 1910. It is an extraordinary historical fact that what was believed in 1910 to be a new invention was described in the year 1513 by the famous anatomist Vesalius:—

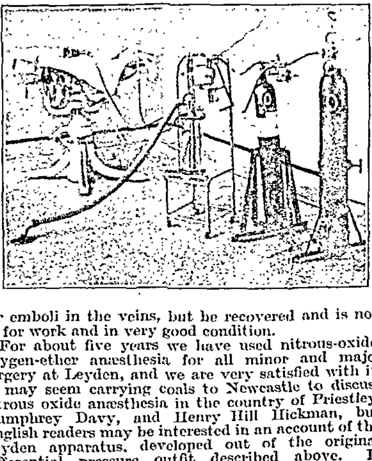
> Concerning the danger of suffocating the animal through the collapse of both lungs: to keep the animal alive one must try to open the windpipe and place therein a tube made from a quill pen or hollow reed. Therein must be blown, so that the lung swells and the animal gets sufficient air. With gentle blowing, the lungs swell so much as to fill the thoracic cavity. The heart regains its force and one can see very *splendidly the phases of the movement of the heart.*

Thus Vesalius in 1543!

In bilateral pneumothorax there can be no doubt that positive pressure apparatus is necessary for life, and I think Lilienthal is quite right when he says, in his well-known book on thoracic surgery, that it is unwise to neglect positive pressure even in unilateral pneumothorax. It is never possible to be certain that unilateral pneumothorax will not cause very grave symptoms, and the risk can be lessened by working under pressure. Our conclusion is, therefore, that positive pressure apparatus is essential for intrathoracic surgery, but it can be very simple, as at Leyden.

Another advantage of positive pressure anæsthesia is the prevention of air embolism in the veins, a point stressed by Sauerbruch in 1924 at the Surgical Congress at Berlin. One case in my clinic could hardly have been operated on with any hope of success without this form of anæsthesia. He was a young dentist with a large lymphogranuloma on the front of the neck and chest. The tumour had a very extensive venous anastomosis with the veins of the chest wall, and the risk of air embolism in cutting the vessels under the tumour would have been very great. He was operated on under an expiratory pressure of about 20 c.cm. of water, and even so there were small air emboli in the veins, but he recovered and is now fit for work and in very good condition.

FIG. 2.



For about five years we have used nitrous-oxide-oxygen-ether anæsthesia for all minor and major surgery at Leyden, and we are very satisfied with it. It may seem carrying coals to Newcastle to discuss nitrous oxide anæsthesia in the country of Priestley, Humphrey Davy, and Henry Hill Hickman, but English readers may be interested in an account of the Leyden apparatus, developed out of the original differential pressure outfit described above. It increasing difficulty in swallowing, so that at times food would not pass into her stomach at all. She had a high degree of pneumatosis of the stomach and colon with a curious position of the stomach, which was displaced to the right and had an hour-glass form. Thick rubber tubes passed easily into her stomach, and through them came an explosion of gas. Many observers regard this condition as cardiospasm, and the hour-glass form of the stomach as due to another spasm. When I operated on this patient I found her stomach rotated about its long axis. I tried to replace the pyloric part of the stomach, but it tended to relapse, and I therefore resected it after Reichel's method. This operation was unsuccessful. Not knowing what to do, I made a gastrostomy opening to let the air out, and that gave the patient distinct relief. If air came freely out of the tube the patient could swallow and her heart symptoms, such as extrasystoles, disappeared. When the stomach was blown up with air through the tube the bismuth meal did not pass through the œsophagus properly, but as soon as the air was allowed to escape, the meal passed into the small intestine (the stomach having been resected) with a run. The patient at times had many very disagreeable sensations, even when she was not taking food, when her air escape tube failed to work or was stopped by fluid. She was, therefore, provided with an apparatus to work under her clothing: the gastrostomy tube passes to a small flat bottle which catches and retains fluid, the air passing out by another tube which discharges at her shoulder. If the tube is stopped up, she presses a button, closing the outlet, and then blows the tube clear with a bellows. (Fig. 9.)

FIG. 7.

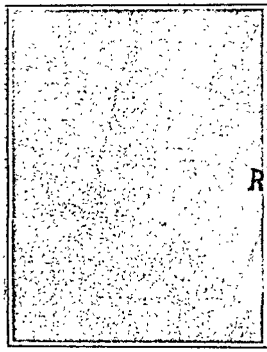


FIG. 8.

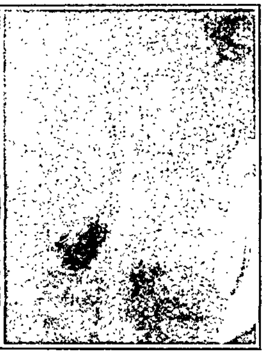
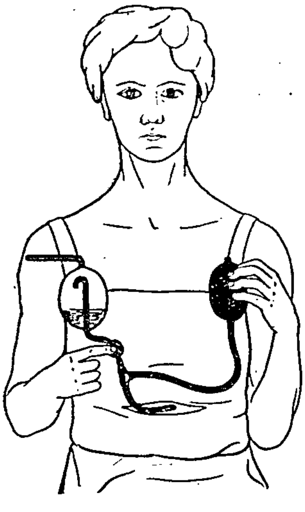


FIG. 9.



Imagine the position of a woman like this in the Middle Ages. She had many nervous symptoms which often made her disagreeable. She might well in those days have had a false friend who accused her of being bewitched. Very probably she would have been put to the floating test. She would have floated, proving that she was indeed a witch and ought to be burned because the devil in her made her float. But it would not have been the devil, but the bubble of air in her stomach—nowadays revealed by X rays.

ORGANIC STRICTURES OF THE ŒSOPHAGUS.

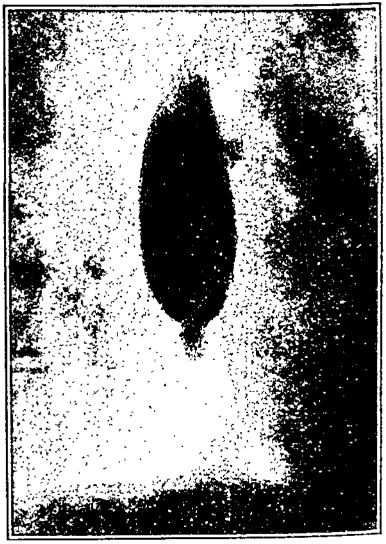
Organic strictures of the œsophagus as a rule can be dilated, and, in Anglo-Saxon countries, are dilated, by Plummer's method; the patient swallows a silk thread which passes well into the intestine and thus gives a purchase, so that the thread may be stretched and a perforated sound pushed over it through the stricture. I customarily treat these patients by von Hacker's method, picking the swallowed thread out through a gastrostomy and drawing soft rubber tubes through by its means. The thread must be left in for a month or more. Now a thread, whether it be of silk or of cotton, gives the patient a disagreeable sensation of cutting in his throat. A thin rubber tube will not cause this, but the patient will bite it through. If a thread is put inside the tube, it will not cut the throat, nor will the patient bite the tube through.

In several radiograms, I have seen the bismuth shadow end in a knob. I have no explanation for this phenomenon, but it seems to have some value in the differential diagnosis of benign strictures. (Fig. 10.)

A man of 49 who had had gastric trouble for 14 years had been treated for gastric ulcer by gastrostomy and jejunostomy. As he subsequently experienced difficulty in swallowing, his disease was taken for carcinoma of the œsophagus, a gastrostomy was made, and he was pensioned as an incurable case. In that condition he came to our clinic. The X ray examination revealed the condition shown in the illustration. (Fig. 10.) Œsophagoscopy showed a stricture only and no tumour. He swallowed a thread, which was fished up in the stomach by means of an operation cystoscope, and his stricture was then dilated in the usual way. He was cured and has remained in the best of health for five years. It is a curious sign of the times that he could not get back his position because he had been administratively declared incurably ill and pensioned. If the administration has declared you incurable it is very difficult to be administratively cured!

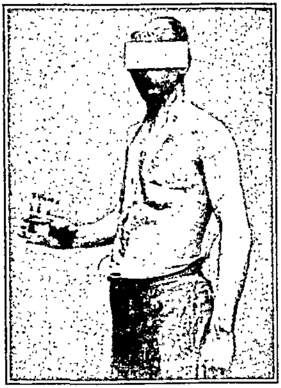
If a benign stricture cannot be dilated, the patient has to choose between going through life with a gastrostomy and undergoing a serious operation. For strictures situated higher up an antethoracic œsophagus may be made or a transthoracic operation may be performed. The latter is much the more dangerous and therefore is to be rejected. There is at Leyden a case of antethoracic œsophagus made after Lexer's method eleven years ago. The patient had swallowed hydrochloric acid and had a stricture some few centimetres above the diaphragm. It could not be dilated, so a short loop of small intestine was isolated, remaining connected to its mesenteric vessels and sutured to the stomach and to the skin, making a gastrostomy by Tavel's method. A skin tube was then constructed, and an opening for the œsophagus made in the neck. The two tubes were connected by little plastic procedures, which is perhaps the most difficult part of the whole treatment. The patient is now a man-servant in the hospital and eats normal food like a normal man with other servants, thus

FIG. 10.



proving the great and lasting value of this method. The picture (Fig. 11) shows him drinking a glass of water, which is still dilating his skin tube. Solid food enters the stomach in a few minutes.

FIG. 11.



For strictures situated low down, operations through the abdomen have been performed with good and lasting results. About thirty records have been published; we have so treated two men, both of whom were cured.

THE SURGICAL TREATMENT OF BRONCHIECTASIS.

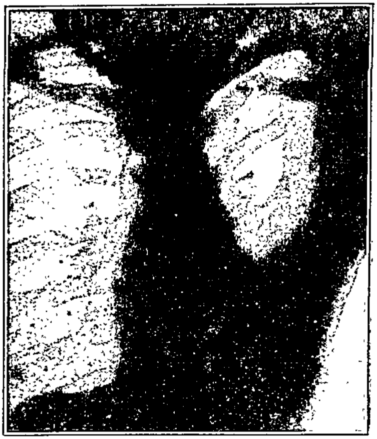
I have chosen the subject of bronchiectasis from the chapter of lung surgery because it is one that has developed along particular lines in our clinic, and we have now a very well-defined series of stages of treatment for these patients. The series is so designed that each stage comes to its climax in an operation, but the patient can be cured at every stage, and each operation lessens the danger of the succeeding stage if this is unavoidable. So that lobectomy, in addition to being an almost certain cure, is no longer a dangerous operation. I shall consider here only unilobar infections of the lower lobes, as these are, happily, the most frequent.

French authors are very satisfied with avulsion of the phrenic nerve and regard it as the "opération de choix." In England, as in Germany, the results do not seem very good, and we in Leyden have seldom seen much effect from this procedure. One patient only showed great improvement at first, but some months later she had a bad relapse. She had a fragment of bone in her right lower bronchus, and did not recover after removal of the fragment through the bronchoscope by my colleague Prof. Kan. She has not yet brought herself to accept further treatment. Another young girl with bronchiectases in the right lower lobe had a 50 per cent. improvement in the quantity of sputum, and the foul smell disappeared.

The second stage is a thoracoplasty. It must be a rule that a therapeutic procedure shall interfere as little as possible with the function of the healthy part of the organ. A thoracoplasty made over almost the whole half of the chest wall, as in the methods of Sauerbruch, Brauer, and Wilms, damages the upper lobes seriously; they are, therefore, not the methods of choice. My colleague Tendeloo has shown that a local thoracoplasty scarcely affects the whole lung, but brings about its effect chiefly on the parts underlying it. Therefore I think that an extensive resection of ribs over the affected lobe is a wise procedure, but it is essential also to remove the periosteum and the intercostal muscles. The conviction of this necessity was brought home to me by the case of a man of 20 whom I treated in 1914 by extensive subperiosteal resection of the seventh, eighth, ninth, and tenth ribs over the affected lobe. He was cured at the time, but had a serious relapse six months later. In the subsequent operation the newly formed plaque of bone and a large piece of the sixth rib were removed, and after that operation he recovered completely and has remained in excellent health for 13 years. At one time he had a large quantity of foul-smelling sputum and was socially quite inacceptable; he has now married a very nice woman. In another case I obtained complete cure by a local thoracoplasty over the affected right lower lobe, with removal of the periosteum and intercostal muscles. That girl has now been cured for seven years and is engaged to be married. Neither of these patients had any more sputum.

The removal of periosteum and intercostal muscles is not only useful in directly improving the therapeutic effect of thoracoplasty; it also lessens the shock of the operation. This is not to be wondered at, for we know that the absorption of bruised muscle tissue is a great factor in causing shock. It has, however, another advantage. If the thoracoplasty does not succeed or does not give enough relief, the next stage will be an intrathoracic operation on the same territory as the former operation. This will, therefore, become a soft tissue procedure, without requiring the removal of any more ribs. And there is yet another advantage. Perhaps the most important reason for thoracoplasty with removal of periosteum and muscle is that it causes adhesions of the underlying part of the lung at some distance from the site of operation. We know now that nearly all measures designed to lessen the danger of direct operations on the lungs are designed with the object of making adhesions, as, for instance, the subcutaneous gauze packings or paraffin deposits recently recommended so strongly by Sauerbruch. If the ribs are resected in the way I advise, the surgeon not only secures a greater and more precise therapeutic effect, but he also has a splendid preparation for the next stage if that becomes necessary.

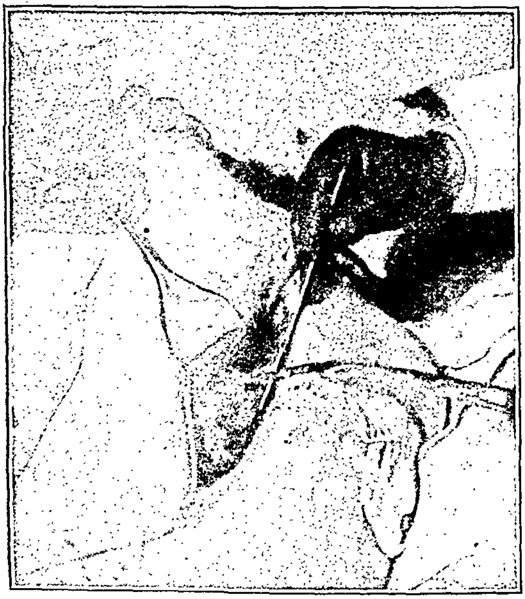
FIG. 12.



The next stage may take the form of either of two procedures: extirpation of the lobe or its slow destruction by burning. Sauerbruch has now abandoned his method of ligating the artery of the lobe in order to remove it. Graham's method of burning it out is associated with rather serious risk of air embolism and hæmorrhage. Resection of the lobe in the usual way carries with it great danger from shock and the chance of a permanent broncho-fistula. After losing a patient after lobectomy from shock and hæmorrhage I arrived at an intermediate stage between a thoracoplasty and a lobectomy—viz., the intrapleural plugging of the pleura after freeing the lobe as nearly as possible back to its root. This measure can give complete and lasting cure by causing compression of the diseased lobe, and in that case cure is attained with a minimum of danger and without the disagreeable complication of a broncho-fistula. X ray photographs show that the upper lobe is not collapsed after this procedure and it continues to function quite well. (Fig. 12.)

If this fails to cure the patient, because the lobe is too indurated to be compressed, then the last stage—so greatly feared until recently because it had a mortality of 50 per cent.—is really no longer very serious. If the plugs are well placed around the root of the lobe and it will not collapse, the surgeon will find on removing them that the lobe forms a more or less pedicled structure in the closed pleural cavity around it. It can be removed without shock by slow elastic stricture of the root. This can be done in the ward without pain when the doctor pays his visit. (Fig. 13.) The elastic tube is tightened every day and the lobe is choked, undergoes necrosis, and falls off—or can be removed by cutting some necrotic threads—in about a fortnight. Only very small broncho-fistulæ *appear, and the after-treatment is loose plugging of the* cavity with gauze. The cavity gradually becomes smaller and smaller, and at last the wound is closed, perhaps with, but possibly without, a small broncho-fistula. A German lady suffered from bronchiectases in her right lower and middle lobes. These lobes were removed and the wound healed. She has now been in good condition for about six months and has only a little sputum occasionally. Moreover, she has no broncho-fistula. The radiogram after operation shows that the right upper lobe contains air and the breath sounds are nearly normal.

FIG. 13.



METROPOLITAN HOSPITAL, HACKNEY.—An endeavour is to be made to raise £50,000, of which £20,000 will be required for building the new nurses' home and £10,000 for urgent schemes, such as the provision of new accident wards and improvements to the surgery.

A NEW DEVONSHIRE HOSPITAL.—Lord Mildmay, the Lord-Lieutenant of Devon, recently opened the new South Hams Hospital at Kingsbridge. The hospital includes a men's and a women's ward, each containing six beds, two private wards, and an operating theatre.

CHRONIC LYMPHOID LEUKÆMIA.

BY P. N. PANTON, M.B. CAMB.,
DIRECTOR OF THE HALE CLINICAL LABORATORIES, LONDON HOSPITAL;
AND
F. C. O. VALENTINE, M.R.C.P. LOND.,
ASSISTANT DIRECTOR.

Classification.

THE leukæmias are commonly divided into the myeloid and lymphoid types and each type is subdivided into an acute and chronic form. The subdivision is, in the myeloid form, both clinical and histological, since the acute and chronic forms are associated with different blood pictures. Acute myeloid leukæmia may arise de novo or less commonly as the terminal phase in chronic myeloid leukæmia, but in either event both the clinical state and the blood picture are entirely different in the two conditions. We are concerned in this communication with the state commonly described as chronic lymphoid leukæmia, and we understand by that a chronic process, of several months or years' duration, associated with enlargements of the lymph glands, or of the spleen or of both, accompanied by an anæmia, a considerable increase of the white cells, and a high relative increase of the lymphocytes. The lymphocytes are sufficiently like to the normal cells to be recognised as such and may be of the small or large varieties, or much less commonly the blood may show a more or less even admixture of the two types of cell. A pure type blood picture, that is, one in which the lymphocytes are nearly all small or nearly all large, remains constant during the whole course of the disease, apart from variations in the total number of cells induced by treatment.

The diagnosis of the leukæmias is necessarily concerned with the difficulty of distinguishing between primitive myeloblasts and primitive lymphocytes. For this differentiation we have employed at various times certain of the special granular stains, but have never been able to satisfy ourselves that any of these methods are capable of distinguishing between lymphoblasts and myeloblasts in their early stages of maturity. For diagnostic purposes we have relied upon Leishman's stain. When the small lymphocyte predominated, the typical cell as a rule showed a very small amount of clear blue cytoplasm, round a fairly typical lymphocyte nucleus. Double nuclei and other irregularities could sometimes be seen. Nearly always a small percentage of more primitive cells was present, which resemble in appearance the myeloblast as seen in chronic myeloid leukæmia. There does not seem to be any conclusive evidence to decide whether these cells are early lymphocytes or not, but in view of the activity of lymphoid tissue throughout the body in this condition, it seems probable that they are early lymphocytes or lymphoblasts.

When the large cells predominate many have a definitely abnormal appearance. Few cells show good azure granules, and many show a fairly deep blue cytoplasm. In these latter, which are probably young cells, there is a tendency for the nuclear meshwork to be coarser than in the adult lymphocyte where it is too fine to be clearly made out, while at the same time the deeply staining aggregations of chromatin, typical of the lymphocyte nucleus, are reduced. In a few cells the cytoplasm stains a greenish-blue and the nuclear network is even and undifferentiated throughout, an effect recalling the myeloblast. These may well be lymphoblasts.

The diagnosis from a Leishman-stained blood film between lymphoid and myeloblastic leukæmia may be on occasion difficult, and since it is dependent upon the opinion of experience may be fallacious. We claim, however, that such diagnosis, based upon the stained film alone, coincides with the clinical state of the patient. If the cells are adjudged to be myeloblasts the patient is in the acute state associated with the characteristic signs and symptoms typical of acute myeloid leukæmia. If the cells are lymphocytes a very different clinical condition is present. In the great majority of our cases the hæmatological diagnosis has been arrived at, in the first place, without reference to the clinical state. This appears to us evidence that we are able, in Leishman-stained preparations, to distinguish between atypical lymphocytes and the more primitive mother cells, lymphoblasts and myeloblasts. Since we have never seen the clinical state or blood picture in these chronic lymphatic leukæmia cases change to an acute lymphoblastic phase comparable to what may occur in myeloid leukæmia, and since the cells in all the acute leukæmias we have seen are either indistinguishable from the myeloblasts present in small numbers in the chronic cases, or evidently, as in the Rieder cell type, of marrow origin, we prefer to describe these acute cases as myeloid and not lymphoid leukæmia. The acute lymphoid condition is frequently described, and while we are not justified in suggesting that such a state does not exist we are acquainted with some published cases in which we should have unhesitatingly described the cells as myeloblasts.

Ætiology.

During a period of 16 years, from 1912 to 1927 inclusive, there have been 25 cases of chronic lymphoid leukæmia at the London Hospital. During the same period there occurred 89 examples of chronic myeloid and 58 of acute myeloid leukæmia.

The sex incidence of the leukæmias is of interest. In the chronic lymphoid state 20 were in men and only 5 in women, giving a ratio of 4 : 1. In the chronic myeloid cases 46 were men and 43 women, and in the acute myeloid 37 were males and 21 females. Chronic lymphoid is therefore the only form of leukæmia in which sex is an ætiological factor, and this finding appears to gain additional significance when one learns that the average age incidence of our cases is 55 years and that a recent history of impotence is not uncommon. Acting upon this somewhat slender evidence an extract of sheep testicle was prepared by the same process employed for liver extraction in the treatment of pernicious anæmia, and was administered by the mouth in one case of chronic lymphatic leukæmia in this series. No effect whatever was observed to follow the use of the extract.

The average age incidence in this series was, as has already been mentioned, 55 years. Only 2 cases were under 40, one being 20 and the other 35. The average age is therefore considerably higher than that of other forms of leukæmia.

Of the 25 cases, 9 were Hebrews, 13 were non-Hebrews, and the nationality of the remaining 2 cases was uncertain. This gives a ratio among the cases of known nationality of 1 : 1·4. The ratio of Hebrew to non-Hebrew patients in the London Hospital is not accurately known, but is more nearly in the neighbourhood of 1 : 10, indicating that the Hebrew race is particularly susceptible to this disorder.

Course and Symptoms.

The duration of the disease from the onset of clinical symptoms until death was only determined in 21 cases. In these the average duration was 2·17 years, but the series included a man and a woman who lived for 7 and 6 years respectively.

The lymph glands were palpably enlarged in all cases, with one exception, a woman who was only observed over a short period. The spleen was found enlarged on clinical examination in 20 patients, but in only 4 cases was the lower pole of the spleen found to descend below the level of the umbilicus. In 15 cases of the series the earliest symptoms were those of lymphatic enlargement, and the commonest site of this enlargement was in the cervical lymph glands. Four patients noticed abdominal swelling as an early symptom.

Analysis of the blood picture in this series shows that in 19 cases the predominant cell was a small lymphocyte and in 6 cases the large lymphocyte, and of these 6 cases all had glandular enlargement but only 3 splenomegaly, whereas 17 of the 19 small lymphocyte type cases had enlargement of the spleen. The average of the highest count was for the 6 patients with large cells 66,000 and for the 19 with small cells 208,000. The number of cases is small, but it would appear that in the large-celled lymphoid leukæmia there is a greater tendency to lower white cell counts and less splenic enlargement. The distinction between small and large lymphocytes is not absolute in the normal blood, and in these cases was not infrequently difficult. In most cases either the small or the large cell was overwhelmingly predominant, but in one patient—No. 18—the two types of cell were present on numerous examinations in about equal proportions.

Anæmia was present at some period in all cases, but in no less than 14 out of the 25 patients the red cells were in the neighbourhood of 5,000,000 per c.mm. or even above this figure in the earlier examinations. The colour-index was usually that of a secondary anæmia, but in some cases with a low red cell count the index rose to 1·0 or even higher.

Treatment.

The treatment of these cases did not differ greatly from that given in chronic myeloid leukæmia and consisted for the most part in arsenic given by the mouth and X rays administered over the splenic area. In the majority of cases X ray treatment consisted in massive doses given over the splenic area and resulted, as a rule, in a diminution of the white cell count. A comparison of myeloid leukæmia cases similarly treated showed that the subsequent leucopenia lasted longer in the lymphoid cases, and that the subsequent malaise was more severe and more prolonged. In our experience and in that of many others no example of cure of any leukæmic case has resulted from arsenic or X ray treatment, and we doubt if any prolongation of life is achieved. In chronic myeloid leukæmia, however, some diminution in size of the spleen, and occasionally a return almost to the normal size, results, and the patient is rendered correspondingly more comfortable. Also, accompanying the diminution of the white cells, patients do experience a certain feeling of well-being, and on psychological grounds alone the treatment is worth pursuing in the absence of any known remedy. In the chronic lymphoid cases, enlargement of the spleen is rarely sufficient to embarrass the patient seriously; the disturbances set up by the treatment may be considerable, and we feel strongly that this form of X ray treatment is, in the majority of cases, better avoided. On the other hand, X ray treatment of the lymphatic enlargements is often of great value and should always be employed when the glands are of sufficient size to inconvenience or by pressure to distress the patient. The lymphatic swellings nearly always subside rapidly under X rays. Case 5 of this series was first seen in January, 1921. He had marked enlargement of the spleen and of the lymph glands. The white cell count was 102,000 per c.mm., and after intensive X ray treatment his spleen became reduced in size and the white cells dropped to 3400. At this time (April, 1921) the patient was extremely ill and appeared to be almost moribund. Treatment was stopped, and as soon as the patient was fit to be moved he was taken to a convalescent home. He subsequently returned to his work as a carman, his white cell count rose to 50,000, and finally 343,000 per c.mm., and he continued at work with no treatment and in fair health until March, 1926, when he died of heart failure. Other cases in the series might be quoted as examples of the dangers of over-treatment and the possible advantages of no treatment at all.

Cause of Death.

The actual cause of death in the great majority of these patients is unknown, since death did not occur in hospital, and no post-mortem examination was obtained. Two patients who died in the London Hospital are of interest, because death in each case resulted from sepsis following upon a minor lesion. One of these patients was a man of 63 who appeared to be improving under rest in bed and X ray applications to the chest when he burnt his finger with a match while lighting a cigarette; the resulting blister became infected and he died of septicæmia in a few days. The other patient was a young Jew who died after four days' fever following the development of an alveolar abscess. We have known other examples of fatal sepsis occurring as the terminal event in lymphoid leukæmia, and the resistance of these patients to pyogenic infection appears to be extremely low.

We are indebted to the members of the staff of the London Hospital for permission to make use of the notes of their patients, and to Dr. Arnold Ash, formerly assistant director of the laboratories, for many of the blood examinations as well as for his help in collecting the records of the cases.

TREATMENT OF TABES DORSALIS AND ITS RESULTS.

BY W. J. S. REID, B.Sc., M.D. ABERD.,
M.R.C.P. LOND.,
HONORARY PHYSICIAN TO ANCOATS HOSPITAL, MANCHESTER.

THE treatment of tabes dorsalis advised in text-books is by no means uniform, and the prognosis from treatment is equally varied. The end-results are stated so indefinitely that it is hard to form any idea of what can be achieved. Leredde [1] certainly strikes an optimistic note, but his treatment of tabes is now really the routine treatment for an ordinary case of syphilis. Browning and Mackenzie [2] state that the "treatment of 62 cases of tabes leaves no room for doubt that it should be employed in every case. In some cases treatment will meet with complete failure, in others it will be accompanied by surprising benefit." The treatment spoken of is the ordinary routine treatment for syphilis by salvarsan remedies. Meirowsky and Pinkus [3] give even less encouragement, and advise that practically only one course of anti-syphilitic treatment be given, to be repeated possibly in six months, and that thereafter the treatment should be more or less symptomatic. Sachs [4] favours the energetic use of salvarsan combined with mercurials in the initial treatment of tabes dorsalis, but does not give a clear idea of the results, indicating rather what they may be in favourable cases.

To determine what could be achieved very careful observations were made of a considerable number of patients treated over a period of upwards of ten years. The patients were treated, except for some few short periods, as hospital out-patients or as private patients; confinement to bed or to an institution is not necessary or advisable and tends to depress the patient. A patient suffering from tabes should be encouraged to do his work as long as it is physically possible for him to do so. Tabes is still very common and is generally recognised to be a syphilitic lesion, the former designation of parasyphilis being both incorrect and unsatisfactory. With the great advance in anti-syphilitic treatment in the earlier stages by arsenical remedies it was hoped that the nerve affections would become much fewer. This hope has not been fulfilled, some even claim that tabes and other nerve conditions have shown an increase, for which the newer medication has been held responsible. It may well be that modern medication is in some degree responsible because of discontinuance short of complete cure. As Harrison [5] has suggested, the striking early effects of treatment may lull the patient into a false sense of security, so that he does not attend for treatment.

The aim of Ehrlich was to free the body from the disease by one large dose, the "dosis sterilisans magna." This was early found to be impossible in the majority of cases, and treatment was administered in series of courses of injections. The series have lengthened progressively with the passage of time, and even now very frequently fail to sterilise the body of its infection. If, however, complete sterilisation is not achieved the treatment has certainly deprived the body of much antigen, and the immunity level of a case incompletely treated is likely to be lower than that of an untreated case; this may well be a partial explanation of nerve complications arising later. The question of immunity in the late stages, and in fact in all stages of the infection, has been much neglected, though one might hesitate to subscribe to the views of Boeck [6] that practically no cases of neurosyphilis occurred in untreated cases. In this country cases are certainly seen where the onset of nervous symptoms is the first indication that an infection has occurred. The original infection must be long and carefully treated by the newer remedies if nerve lesions are to be avoided.

Treatment of Established Cases of Tabes.

Cases may, for purposes of treatment, be divided into two classes: (1) those not previously treated, or only insufficiently treated for syphilis; (2) those who have had long and apparently thorough treatment for syphilis by the newer remedies.

In Class 1 it has been my experience that the Wassermann reaction of the blood is positive, in some cases very strongly positive. In those cases which show any signs of tabo-paresis it has been always strongly positive with perhaps one exception; but such cases should be grouped rather under general paresis than under tabes, and their treatment by any method other than malarial therapy is hopeless. I have also usually found the W.R. of the cerebro-spinal fluid to be positive.

In Class 2, on the other hand, these reactions may be positive or negative, or may be now negative and after a little treatment may revert to positive, and vice versa. In other words, the reactions are not infallible tests of the condition, though they have much importance. A positive W.R. is always a very valuable sign. A negative W.R. after a series of positives may be of value as a guide in treatment, but an isolated negative reaction of blood serum or of cerebro-spinal fluid may have no value at all. The sign of greatest clinical value in my experience has been the cell count and to a lesser degree the globulin-content of the cerebro-spinal fluid. In tabetic cases before treatment counts have been obtained up to 90 cells per c.mm., and even higher in cases of tabes who had had no intensive treatment for syphilis.

In Class 1—that is, those who have had no treatment for syphilis at all, or only medicines by the mouth or inunctions, which latter, in this country at least, are hardly ever persevered with long enough to be effective—a system of treatment has been carried through in every case just as if the patient's condition was one of tertiary syphilis. This has always been persevered with until the blood Wassermann reaction has fallen considerably, sometimes to negative or in many cases to a weak positive. During this treatment the patients have been most carefully watched for signs of over-dosage or intolerance of the drug. The worst results of over-dosage are hepatitis and dermatitis, and at the first sign of either recourse has been had to thiosulphate of sodium, which is wonderfully effective in such cases. Special care in the treatment is required in all cases of tabes, and this care has much to do with the success. It is a disaster if hepatitis does develop, but this can be avoided by taking special care of the patient generally, and by not administering too large or too frequent doses of the drug. In my experience 0·6 g. of "914" is a large enough maximal single dose.

In the tabetic the vegetative nervous system is affected in every case. Very often intestinal action is sluggish, and while the whole action of the autonomic nervous system on the viscera is not yet understood its impairment must be assumed to reduce the efficiency of the viscera. This is of the utmost importance in a treatment which requires the administration over long periods of compounds which have a cumulative effect unless perfect action of the organs ensures their excretion from the body. Therefore tabetics must be frequently examined with the greatest care during treatment.

When three or more courses of injections have been given, each course amounting in all to about 5 g., with the same number of courses of bismuth or mercury given intramuscularly, and when blood Wassermann reactions have yielded lower results, this class of case can be grouped with the second class as having undergone sufficient general antisyphilitic treatment for some treatment to be undertaken, directed specially to the nerve condition. A patient treated as above has generally improved very considerably, but his nerve symptoms may or may not have been subdued. In 1916 I tried intraspinal therapy after the method of Swift and Ellis[7] on ten patients, but discarded it because it was not without pain and the amount of drug or its derivatives that could be introduced into the theca seemed to be too small to be of value. The method did not yield the results claimed for it.

Reinforcement by Drainage.

A method of "reinforcement by drainage," if the terminology be permissible, was therefore tried and has yielded much better results; it is the method now used in all my cases. The procedure is as *follows :—*

An intravenous injection of 0·25 to 3 g. of Silber-salvarsan is given. This drug is sold by Meister, Lucius, and Bruning, and is, in my opinion, the finest preparation for the treatment of nerve lesions. Within ten minutes a lumbar puncture is done with the patient in the sitting position, and as much cerebro-spinal fluid as possible is drawn off until discomfort is caused. If the fluid is withdrawn slowly through a small-bored *flexible needle of White's Jeanselme pattern 50 c.cm.* or more can be withdrawn slowly before any occipital headache is complained of. The patient is left lying down for six hours, and then goes home and remains in bed for 24 hours. Lumbar puncture done with novocaine is not painful, and with a fine needle the discomfort is minimal. This operation was performed five times at fortnightly intervals. In the intermediate weeks the patient had an intravenous injection of Silber-salvarsan without the lumbar puncture. At the end of a course the cerebro-spinal fluid was found to have reverted nearly to normal in a large proportion of cases, and in all of them was much improved. This course has been repeated twice or three times with intervening periods during which the patient was on bismuth or mercurial treatment, or being treated with iodide of potassium or with tonics.

*This method was found much superior to intra*spinous therapy and has caused no ill-effects in any case. The idea originally underlying the treatment in my mind was that by reducing the pressure on the fluid side of the choroid plexus and increasing the concentration of arsenical bodies on the somatic side of the plexus, the fluid, which has to be regenerated quickly, might be expected to contain a higher amount of the arsenical body or its derivatives than otherwise, especially as there is much evidence that the formation of the fluid is by osmosis and not secretion (Fremont-Smith).[8] It must be borne in mind, however, that drainage of the cerebro-spinal fluid is per se of the greatest value in cases where there is inflammation of the meninges, and may be relied on to be beneficial in tabes, so long as an increased cell count is present as evidence of inflammation. There is therefore double benefit in drainage. Probably the best time to perform drainage is just after intravenous injection. Although the fluid drawn off has been examined on each occasion, a sample has always been drawn off one month after the last drainage of the treatment course *and examined as to cell-content, globulin-content,* and Wassermann reaction. A sample of blood was submitted to the Wassermann reaction at the same time. If the cell-content was down to normal level and the Wassermann reaction of the fluid was negative, the patient was continued under the ordinary treatment for syphilis, on a less intensive scale, for a year at least, the periods of rest between courses being progressively increased. A year later the fluid was examined again, and only in those cases where the cell-count was beyond the normal *limits of seven cells* per c.mm., or the W.R. of the fluid was definitely positive, was another intensive course of therapy directed toward the nerve lesion. The W.R. of the blood serum may have yielded a positive or negative reaction, but in either case a course of ordinary antisyphilitic injections was carried out every six months.

Results.

In the period 1916 to 1927 104 cases of tabes dorsalis have been treated in this way, and, while periods of remission are often so long that it is difficult to assess the value of treatment, sufficient time has perhaps elapsed for a claim to be made. The result of treatment in these cases has been to reduce the cell-content of the cerebro-spinal fluid to the normal limits in every case and to maintain it there. The W.R. of the fluid has been reduced considerably in all cases, and in most of them is now negative, while the W.R. of the blood serum has been in many cases reduced to negative, or sways between negative and weakly positive when tested over a period of years at three-monthly intervals. In a disease like tabes cure, in the strictest sense of the term, cannot be spoken of or seriously considered. Nerve-fibres inside the dura mater, once destroyed, can never be regenerated, and therefore all patients when examined clinically still reveal the picture of tabes. The knee-jerks are absent and the light reflex is gone, but the disease has been arrested in its progress and, in some exceptional cases, is believed to have been eradicated.

The general condition of all the patients improved very considerably. Many of them when first seen were very asthenic and almost emaciated; in fact, in my experience the disease is usually accompanied by wasting, accentuated by the diminished muscular tonus. In some cases the increase of weight was very striking, and an increase of up to 2 st. was common. The improvement in the lightning pains has been very marked in every case. Here the effect of drainage of the cerebro-spinal fluid is especially helpful; at the *end of a series of five punctures the pains were in* every case much reduced in frequency and intensity, and ceased to be "lightning" in nature. In some cases, especially those which were advanced, the pains altered in character and the patients complained of a dull persistent pain. This may be due to the fibrotic process round the nerve roots, and if so it is hard to see how these pains can be removed, except by section of the nerve roots. They are akin to girdle pain, which is not influenced by treatment. The visceral crises responded equally well to treatment. In the acute gastric crises atropine sulphate injected subcutaneously with or without morphine has been found most effective; a single hypodermic injection could be depended on to give rest and relief for four hours, and after one or two repetitions the crisis had passed off. The anæsthesia which is universal in the disease was, of course, unaffected by treatment. The bladder symptoms were benefited and in many cases were so much subdued as to be almost gone. They were ameliorated in all the advanced cases. The arthropathies of the disease, the Charcot's joints, appeared *in one or two cases during treatment, and even after* treatment was finished, but as this is a trophic lesion its onset is not proof of progression, but of a lesion which has already progressed sufficiently to cut the nerve-supply to the part, and there is no reason to hope that any treatment will be able to restore this innervation. The same is true of the mal perforans, though no case of this appeared during or after the treatment. Those which were already present healed up with care and rest, and treatments were not suspended on their account. It was hoped that drainage of the cerebro-spinal fluid, by reducing pressure, might help optic atrophy, but that hope was not fulfilled in any case, and there is no reason to anticipate any improvement with present remedies.

In some patients the optic atrophy seemed to be arrested, and this is the most that can be hoped for; in some others it progressed very rapidly to complete blindness, but not more rapidly than in untreated cases. There is no reason to believe that treatment by arsenical remedies accelerated the atrophy, and therefore nothing to indicate withholding the drug. In one or two cases tryparsamide was used, but the danger of optic atrophy so strongly insisted upon in the literature made a sufficient trial of that drug undesirable. On the other hand, the pareses of the orbital muscles completely disappeared under treatment. The ataxia did not improve directly as a result of treatment, but the improvement in their general well-being enabled the patients to take more exercise, so that the process of re-education progressed very rapidly, and as they regained confidence they complained less of their ataxia.

Conclusions.

Tabes dorsalis should be treated very thoroughly, and the method of lumbar puncture in conjunction with intravenous medication can be relied upon to restore the cerebro-spinal fluid to something approaching normality.

In most cases the progress of the disease can be arrested if treatment is persevered with.

In spite of treatment optic atrophy may progress and become complete.

The improvement in the general condition is very considerable and the increased efficiency of the patient very striking.

Naturally the results achieved vary with the stage of the disease at which treatment is undertaken. The earlier the stage of the disease and the less nerve destruction that has occurred the better the results of treatment will be, but in practically no case should treatment be refused.

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CALCULOUS ANURIA.

BY H. P. WINSBURY WHITE, F.R.C.S. ENG.,

ASSISTANT UROLOGICAL SURGEON, ST. PAUL'S HOSPITAL FOR GENITO-URINARY AND SKIN DISEASES; ASSISTANT SURGEON, EAST LONDON HOSPITAL FOR CHILDREN; UROLOGIST, ST. JOHN'S HOSPITAL, LEWISHAM.

THE suppression of urine due to calculus may be complete or partial. Although it occurs at all ages in both sexes it is most common after 40 and more frequent in men than in women. The cessation of the renal function may be caused in one of the following ways: (1) obstruction to the escape of urine from both kidneys; (2) obstruction to the escape of urine from the only kidney; (3) occlusion of one kidney and inhibition of the other, which is partly damaged; (4) as the climax of a gradual but progressive renal failure resulting from long-standing and extensive bilateral calculous disease, occurring quite independently of renal occlusion; severe exertion is often the means of precipitating an attack by causing the misplacement of a stone into a position where it can obstruct.

The calculus may be in the ureter or the kidney. In the ureter it is most commonly found in the upper third, next most commonly in the lower third. In the kidney it is sometimes quite a small stone situated in the pelvis, of which it blocks the outlet. Anuria in a kidney containing widely distributed stones generally means considerable permanent impairment of renal function and is not likely to be remedied by surgical measures. There is experimental evidence to support the belief that reflex anuria may result from unilateral disease, the kidney on one side being perfectly healthy. The influence of the diseased kidney on its supposedly healthy fellow is spoken of as the reno-renal reflex. Goetzl, experimenting on three dogs, produced complete anuria in one for 65 minutes by raising the pressure in the renal pelvis. In the other two, although he did not succeed in producing complete anuria, he obtained marked diminution in the amount of urine secreted. Rovsing has reported three experiments in which he produced complete anuria for periods of two or three days by clamping the pedicle of one kidney. The anuria persisted while the clamps were in position and ceased when they were removed. Israel has reported two cases illustrating the same process clinically. In each of these, after removing an obstructing stone, cystoscopy showed a return of the urinary flow from the opposite side. Although these observations all establish conclusively the influence of a diseased kidney over the function of the other, most authorities hold that the condition of complete anuria depends upon disease of both kidneys and that the microscope will always reveal some pathological change in the supposedly healthy kidney. Kelly and Burnam state the position by saying that there is no case in the literature where the patient has had complete anuria and died of uræmia, and at autopsy a stone has been found blocking one ureter while the kidney on the other side was healthy.

A kidney whose secreting function is suppressed is swollen, engorged, has small hæmorrhages under its capsule, and contains blood-stained fluid under tension in its pelvis when the outlet is blocked.

Clinical Features.

The *absence of urine from the bladder* on catheterisation when this organ has not recently been emptied establishes the diagnosis of anuria in the initial stage. The period of anuria has two principal phases: in the first the general health of the patient does not give any indication of the gravity of the prognosis, and the diminished urinary excretion may be the only warning of the impending disaster. The patient may be able to carry on in this way for several days without much inconvenience, or the more serious symptoms may supervene much more suddenly, and headache, irritability, nausea, constipation, and flatulence rapidly leads into the period of intoxication. This is indicated by drowsiness, slow pulse, subnormal temperature, and slow and irregular respirations. These give place to the terminal stage of dyspnœa and coma.

Pain is a variable symptom. Sometimes it is difficult to elicit any history of suffering; other patients readily complain of aching in the loin or of attacks of colic. It is of great importance to establish clearly in which kidney the pain is more recent, for this is probably the least damaged and therefore the one which the surgeon should attack first. A long-standing history of pain in one kidney region, and a recent account of the same symptom in the opposite organ, is a strong indication that the latter is the one which demands the surgeon's urgent attention.

Tenderness may be expected over one or both kidneys and ureters, but when the patient has been living entirely on one kidney tenderness will usually be found only over the recently functioning organ.

Cystoscopy may show the offending stone protruding from the ureteric orifice or bulging the bladder wall just above it.

A *radiogram* of the whole urinary tract is essential.

I recently saw a woman of 31 years of age in a state of uræmic coma. There was a history of pain in the left side and anuria for several days, and a previous history of the passage of small stones at odd intervals. No other helpful facts about the case could be obtained. In the right lumbar region posteriorly there was a small sinus leading towards the right kidney region. There was no urine to be seen coming from the sinus, which was obviously of many years' standing. No radiogram was available. The conclusion was that the right kidney had long ago been destroyed by calculous disease, with perinephric suppuration and sinus-formation, and that the left kidney had now become occluded by a stone. Operation was hurriedly carried out and a small calculus was removed from the pelvis of a somewhat engorged left kidney. The patient died on the same day. The post-mortem examination revealed that the right kidney was represented only by a mass of fibro-fatty tissue surrounding a number of calculi.

Differential Diagnosis.

The identification of the cause of renal failure involves a consideration of a fairly wide range of diseases, of which the following are the commonest. They are not difficult to detect on carefully considering the history and clinical features: bladder growths, prostatic enlargement, urethral stricture, pelvic tumours causing back pressure on the ureters. Kidney damage from drugs such as lead, mercury, and arsenic has to be excluded, while anuria may also arise as a crisis in the course of an acute or chronic nephritis. Post-operative renal failure following operation on the urinary tract or elsewhere offers no difficulty in diagnosis.

Treatment.

Non-operative Procedures.—In early cases, when the ureter is blocked near its lower end by a stone that is not too large to pass into the bladder, ureteral contractions may sometimes be initiated and the stone passed by distending the bladder with fluid. Heitz-Boyer and Elliot reported a case successfully treated in this way. The patient had suffered from anuria for 48 hours. A ureteric stone the size of a haricot bean was passed within an hour of distending the bladder with fluid and urinary secretion was at once re-established. Other similar cases have been reported.

When this method fails after a short trial ureteric catheterisation should be tried, for the passage of the catheter beyond the stone may relieve the crisis by re-establishing the secretion of urine. Two catheters can sometimes be passed in this way, giving still more efficient drainage. These should be left in position for two or three days if the symptoms of anuria continue to subside. At the end of this time the patient is in a much more satisfactory state to undergo an operation. If no result should follow the successful passage of the catheter up one side the opposite ureter should be catheterised also. A little sterile water injected into the renal pelvis will sometimes induce peristaltic contractions and initiate renal activity. In some cases the kidney substance is so badly diseased and has such poor capacity for recovery that there is no response to any of the above measures. Operation in such circumstances will only hasten the patient's end. It must always be kept in mind that the process of kidney destruction from calculous disease is an insidious one and that the onset of total cessation of urinary secretion may be but a small step from the diseased condition which has preceded it. In other words, the final failure is not due to a mechanical blocking by stone, but is simply the terminal stage of chronic renal disease. The failure of any surgical measures is assured in such a case. All the means of relieving and inducing the urinary flow by dietetic and medicinal means must be undertaken energetically. Milk diet should be given to relieve the kidneys of additional work. Hot packs or hot air baths will promote the excretory activity of the skin, and diuretics such as caffeine, digitalis, and Contrexèville water will stimulate the renal function. Saline purgatives should be administered to increase the escape of fluid by the bowel.

Operative Procedures.—The purpose of an operation in a case of calculous anuria should be to provide for the unobstructed flow of urine with the minimum of operative shock. Prolonging the operation by searching for a stone is very likely to be the means of turning the tide against the patient. Therefore, when the surgeon has no idea where the stone lies and the general condition of the patient is not good, the rapid restoration of the urinary flow should be accomplished in the simplest possible way. If ureteric catheterisation and other non-operative measures do not establish this, immediate exposure and drainage of the kidney should follow. When the stone lies in an easily accessible part of the ureter, such as the upper or middle third, or in the vaginal fornix, it may be removed at once. In rare instances the calculus has been dislodged from the ureteric orifice by bimanual manipulation. Pyelotomy should be carried out only when the stone is known to be located in the pelvis, and when it is found on cutting down that this part of the kidney can be promptly reached. Nephrotomy is indicated when the stone is in the pelvic portion of the ureter, when the calculus is in the renal pelvis and found to be difficult of access, or when its exact location is not known.

In all cases in which there is doubt whether the symptoms are due to stone, a radiogram of the whole urinary tract must be obtained before operation. If this is not forthcoming without a dangerous delay the surgeon will have to decide whether the clinical features of the case justify him in proceeding with his search without this information. If it is not definitely known that a calculus is present, he must bear in mind that on exposing the kidney a prolonged search for the stone will considerably diminish the patient's chances of recovery. He should be content, therefore, with establishing the fact that the renal pelvis and the ureter are not obstructed, or, if either is, with relieving the obstruction by the quickest possible means.

Prognosis.

The success of surgical interference in cases of calculous anuria depends chiefly upon the fact that the suppression is due to obstruction by a stone, the length of time the condition has remained unrelieved, and independently of the foregoing, the pre-existing amount of renal damage. In considering a large series of cases it is found that if no means are taken to relieve the obstruction less than 30 per cent. recover spontaneously. The onset of uræmia makes the outlook extremely grave, whether surgical interference follows or not, but successful operations have been reported. Uræmic symptoms do not usually supervene until five or six days after the onset, and the mortality rises steadily with each day's delay in operating. Figures published by Huck show that with operation before the fourth day there is a mortality of 25 per cent., and before the sixth day of 42 per cent. The best operative results are obtained in cases in which the signs of renal failure from calculous occlusion of an otherwise healthy kidney have not come on gradually but suddenly.

AMBULANCE CASES AT BALHAM.—Dr. W. L. Maccormac, the medical superintendent, in his annual report upon the work of St. James's Hospital, Balham, states that during 1928 9105 ambulance cases were dealt with. In the winter months "many of the wards are seriously overcrowded," and it is proposed to provide a new administrative block and a small isolation block.

OPPORTUNITY FOR TRAINING IN DIETETICS.—A Department of Dietetics was established at University College Hospital last November to deal with the special diets, particularly in diabetes, nephritis, and gastro-intestinal disorders. This department is under the control of a member of the honorary medical staff and in charge of Miss E. M. Marshall, B.Sc., who is a fully qualified dietitian. It is hoped later to inaugurate a school for the training of dietitians, with adequate courses of lectures combined with the practical work, for which fees will be charged. At present, while such lectures are not available, there is an opportunity for training one or two pupils in practical dietetic work; the course would last six months, and the instruction would be given free. Candidates should preferably possess a degree in domestic science. Further information can be obtained from the matron of the hospital.

Clinical and Laboratory Notes.

THE VALUE OF JOINT AUSCULTATION.

BY C. F. WALTERS, F.R.C.S. ENG.,
SENIOR SURGEON, ROYAL INFIRMARY, BRISTOL.

THE out-patient surgeon is often confronted with a painful joint, generally a knee, in which initial trauma may have been slight or absent, in which nothing abnormal is visible to the eye or in skiagram, and nothing unusual can be felt. Fifteen years ago these joints, not apparently due to tubercle or syphilis, were treated by massage and other methods in vogue. Some appeared to recover, but in others the pain persisted and the patient not infrequently drifted elsewhere. In other joints with a similar history, fine grating could be felt on movement, although skiagrams usually showed nothing abnormal. Yet, again, other joints would have a still coarser grating, palpable and audible with the unaided ear, and in these well-marked osteo-arthritic changes were seen with X rays. When the first type of joint—in which nothing abnormal could be found—is auscultated, a very fine grating, almost like the hair crepitations in the lung, is heard, especially at the end of complete flexion and extension. The crepitations are of the same timbre as those heard in the coarser types, and when I first detected them I realised that one was probably hearing the earliest changes produced in the joint by the same factor that produced the coarser grating.

When one listened to other joints, as well as the joint complained of, one found that a similar condition often existed in wrist, elbow, shoulder, jaw, and knee-joints, of which no complaint had been made. Only that joint which had suffered trauma became manifest by the appearance of pain or discomfort; the other joints, though affected by a common cause, remained "latent," sometimes to become manifest later on through trauma or advancing age.

A General Auscultation of Joints.

In order to determine whether the auscultation of joints is of any value in distinguishing different forms of joint affections, it was thought advisable first to auscultate a large number of joints in hospital patients admitted for other than joint affections. For this reason wrists, radio-ulnar, shoulders, temporo-maxillary, and knee-joints were auscultated, in ten patients in each half decade, five male and five female (except those below the age of 10, when the sexes were not separated), from 1 to 80 years of age; the cases were unselected, save for sex and age. Some 1600 joints in all were examined under passive movement. As a result of past experience the joints were grouped into smooth (S), rough (R), grating †, grating ††, and grating †††. Joints which crackled, as distinct from grating, were also noted, but not regarded as pathological; for the number of crackling joints lessened rather than increased as age advanced.

The terms I use are as follows:—

The *smooth* joint was one that was quite inaudible to the stethoscope throughout its whole range of movement.

The *rough* joint was audible as the faintest roughness through any range of movement, to a very coarse roughness, as distinct from grating, heard throughout the whole range of movement of the joint.

The grating † joints, or those of the first degree of grating, were those in which a fine hair-like crepitation could be heard by stethoscope at the end of full flexion and extension only, or sometimes over larger ranges of movement, but was quite impalpable.

The *grating* †† joints, the second degree of grating, were those in which the grating was louder and more coarse, heard through part or whole of the joint movement, and often palpable.

Grating †††, a louder and still coarser type, was heard through the whole range of movement, and could not only be readily felt but was often audible to the unassisted ear. This should not be confused with the crackling joint (C), the noise of which is probably often extra-articular as well as due to cartilage movement, as in the temporo-maxillary articulation.

Sites of auscultation were chosen as free as possible from hair, and on the flexor surface of the wrist, over the radio-ulnar joint to the outer side, in front of the shoulder, over the temporo-maxillary joint in women, but a little anterior to it in men, to avoid hair, and on the inner side of the knee over the most prominent part of the internal condyle of the femur.

Previous or existing foci were inquired for in ear, nose, throat, teeth, vagina, and rectum in most cases; bowel habit during life, constipation or otherwise, was ascertained, and rheumatism and other illnesses noted. Past or present possible foci existed in 80 per cent. of the cases examined.

It will be seen in Table I. that, roughly speaking, there is a steady increase through each decade except the sixth in the audible as opposed to the smooth joint. Whereas in the first ten years of life 98·5 per cent. of joints were smooth, and only 1·5 per cent., or three joints in 200, were audible, in the last ten years (70–80) only 18·5 per cent. were smooth, and 81·5 per cent. were audible. Moreover, in the last decade the most severe type was present in 16·5 per cent. of cases; this did not appear at all until the fifth decade. The percentage of rough joints (R) after the first decade does not vary more than 5 per cent. until the last two decades, when it falls by half, to be replaced by the more marked forms of audibility, the †† grating and the ††† type increasing in a marked degree. There is a steadily ascending ratio of all forms of audibility from 1·5 per cent. to 81·5 per cent. with the exception of the sixth decade, but even here the more severe forms of joint grating exceed the earlier figures.

TABLE I.—*Summary of Joints Auscultated in Each Decade, with Classification.*

S.=smooth. R.=rough. Grating †. Grating ††. Grating †††. A.J.=All affected joints.

Decade.	Age.	Totals.					Percentages.					
		S.	R.	†	††	†††	S.	R.	Gr. †	Gr. ††	Gr. †††	A.J.
1	1–10	197	2	0	1	0	98·5	1	0	·5	0	1·5
2	11–15	74	17	8	1	0	61	22	15·5	1·5	0	39
	16–20	48	27	23	2	0						
3	21–25	60	19	21	0	0	59	22·5	18·5	0	0	41
	26–30	58	26	16	0	0						
4	31–35	41	32	22	5	0	39·5	27·5	29	4	0	61·5
	36–40	38	23	36	3	0						
5	41–45	29	22	34	12	3	28·5	26	36	8	1·5	71·5
	46–50	28	30	38	4	0						
6	51–55	32	21	23	12	3	34	27	27·5	11	1·5	66
	56–60	36	33	22	10	0						
7	61–65	30	9	43	16	2	25	12·5	40·5	19	2·5	75
	66–70	20	16	38	22	3						
8	71–75	23	13	27	27	10	18·5	14·5	23·5	27·5	16·5	81·5
	76–80	14	16	20	23	23						

TABLE II.—*Sex Distribution.*

Type of joint.	Male.	Female.
Total	398	427
Rough	184	121
Grating †	172	207
,, ††	75	61
,, †††	8	35

Grating of the second degree is often found in painless joints, but is more likely to be associated with pain or discomfort than is the lesser marked grating or roughness. Grating of the third degree is much more often found with complaint of pain or rheumatism. Of 47 cases with grating †† joints, 25 complained of rheumatism, and 22 had no rheumatism. Of 16 cases in which grating ††† was found, 14 complained of rheumatism and two only did not complain. The most severe grating preponderated in females as 4·37 to 1 male. These figures suggest that whatever may be the cause of the grating, the more arduous work of males is not a factor in its production.

Crackling Joints.

As Table III. shows, "crackling" appears to be least marked in the last decade and most frequent between the ages of 30 and 40. It was heard most frequently in the shoulder-joints, two-thirds as often in the jaw, and one-third as often in wrist, radio-ulnar, and knee-joints. It was not regarded as pathological.

TABLE III.—*Crackling Joints* (c).

Age.	Wrist.	Radio-ulnar.	Shoulder.	Temporo-maxillary.	Knee.	Total.
10–20 ..	1	3	4	10	8	26
20–30 ..	6	0	4	5	5	20
30–40 ..	3	12	16	8	2	41
40–50 ..	4	1	7	9	1	22
50–60 ..	3	2	9	3	1	18
60–70 ..	0	3	12	5	0	20
70–80 ..	0	0	5	3	0	8
Totals ..	17	21	57	43	17	

Conclusions.

(1) Auscultation of joints may reveal a very early stage of roughness or grating, which is not recognisable by other means.

(2) As age advances the grating appears to increase steadily until it is manifest to touch and the unaided ear; in the most advanced stages its cause is visible in skiagram as the joint changes of osteo-arthritis.

(3) These joint sounds are to be heard, by stethoscope, in a large number of hospital cases, unselected save for sex and age, and admitted for other than joint affections.

(4) The number of affected joints, as a whole, preponderate in the female as 55·7 per cent. to 44·3 per cent., the most markedly affected joints, however, existing in the female as 4·3 to 1 male.

(5) These figures suggest that the more arduous work of the male is not a factor in producing these sounds.

(6) A possible past or present focus existed in 80 per cent. of the cases examined.

(7) The number of joints with auscultatory changes becomes more numerous as age advances—from 1·5 per cent. to 81·5 per cent.

(8) The sounds heard, judging from their wide distribution through many joints, are probably the result of changes produced by a blood-borne infection or intoxication. This is confirmed by the fact that the stethoscope will also often reveal, in the same subject, many other joints in which disease is latent and as yet unheralded by discomfort or pain.

(9) The removal of a focus may render a manifest joint again latent, but it will still be audible to the stethoscope and sometimes to touch.

(10) In patients with osteo-arthritis in one joint, many other joints will, by stethoscope, almost invariably be found to be involved in a lesser or greater degree, of which the patient is often quite unconscious.

I should like to thank my late dresser, Mr. K. H. Pridie, for investigating some of the cases in the last decade.

A CASE OF
GOUTY CHEMOSIS TREATED WITH ATOPHAN

BY V. ST. L. PINNOCK, M.B. BRIST.

THE following case seems worthy of record:—

A woman, aged 60, on June 4th, 1928, complained that her right eye was protruding from its socket. Five years previously she had had an apoplectic attack affecting the right arm and right leg with loss of speech. The use of the right arm and leg had later returned w [illegible] the latter.

On examination I noticed that she still had some difficulty of speech and also very slight dribbling of saliva at the right angle of the mouth.

There was considerable œdema of the bulbar conjunctiva of the right eye, which projected well beyond the margin of the lids, but there was no exudation of pus. The cornea was unaffected and appeared to be surrounded by a wall of gelatinous-looking material tinged slightly red. The iris was regular in outline and of good colour; the response to light was immediate. The anterior chamber was shallow and there was a senile cataract of the lens which deterred perception of hand movements but allowed perception of light. She said she had been treated for a "detached retina in this eye" in 1919. She had not been taking potassium iodide for months before the chemosis. The eye was not painful.

The left eye was corrected by a heavy minus lens, thereby maintaining some acuteness of vision. The tension was normal, the cornea clear, and the iris regular in outline and of good colour, reacting to both light and accommodation. The systolic blood pressure was 170 mm. Hg and the radial artery at the wrist was thickened.

Atophan, grs. 7½ three times daily, was prescribed, sodium bicarbonate, grs. 10, being taken five minutes previously so as to neutralise any free acid in the stomach. She was also recommended to use zinc sulphate eye-washes poured on the eye from an undine. Four days later (on June 8th) the chemosis had almost disappeared. She was next seen on Oct. 3rd and informed me that the eye affection cleared up completely following the atophan treatment in about seven days altogether. There has so far been no recurrence of the trouble.

London, N.W.

Medical Societies.

CONFERENCE ON MENTAL WELFARE,
WESTMINSTER.

THE Central Association for Mental Welfare held a conference at the Central Hall, Westminster, on April 25th and 26th. At the first session the subject was the Effect of the Local Government Act, 1929, on the Work of Local Authorities under the Mental Deficiency Acts.

The chair was taken by Sir LESLIE SCOTT, and the Minister of Health opened the conference. He defended the Local Government Act, 1929, and spoke of the unsatisfactory features in mental deficiency administration: variations in ascertainment, shortage of institutional accommodation, and lack of supervision and training for those outside institutions.

Mrs. PINSENT said she thought the provisions of the Act would lead to better classification of institutions and patients and so to efficiency, economy, and more humane treatment.

The New Responsibility of Local Authorities.

Mr. B. S. MILLER presented a paper pointing out the opportunities of the present moment and the dangers to be avoided. The Act, he said, removed obsolete divisions and overlapping due to growth and kept the poor out of "watertight compartments." In the interests of the community all mental defectives should be dealt with under the Mental Deficiency Acts, but the work would be too varied and extensive for any one body. The result should be to reduce the amount of what used to be the guardians' work, while retaining the public assistance committee in an advisory capacity. He described the present position and the proposed scheme for Devon. The main thing for the large authorities to do was to concentrate on providing central colonies.

Dr. H. B. BRACKENBURY said that the Act was a very big step forward towards unification. The public health committee, he thought, and not the mental hospitals committee, should be entrusted with mental deficiency work. Probably in time all institutions except the workhouse would come under that committee.

Sir **Leslie Scott** remarked that under the Act mental deficiency would be dealt with, as it ought to be, as a health matter, whereas in the past the poor defective had come under a different authority from the defective who had means.

On Thursday afternoon the chair was taken by Sir **Frederick Willis**, and Dr. A. F. **Tredgold** read a paper on

The Special Investigation Conducted for the Joint Mental Deficiency Committee.

The findings of this report, he said, might be taken as generally applicable to England and Wales; it was the most careful and complete investigation yet made and a valuable scientific document. The most important fact revealed was the number of defectives in the country. The Royal Commission had estimated in 1906 that there were 4·6 defectives per 1000 total population, equivalent to a total of about 150,000 in England and Wales. Dr. E. O. Lewis put the figure at 8 per 1000. This higher incidence was to some extent, but not wholly, due to more complete ascertainment. It was impossible to resist the conclusion that there had been a considerable increase, both absolute and relative to the total population, in the number of defectives since 1906. The figure of 8 per 1000 was still a conservative estimate, and there were more than twice as many defectives as certified insane in the country. The causes of the increase were: (1) The reduction of infant mortality, with the result that the lives of defectives were saved and prolonged. (2) The differential decline in the birth-rate. On the whole mental defect was essentially a family problem, and in that respect stood in close relationship to mental disease in general, several forms of subnormal mental development, chronic pauperism, unemployability, and many varieties of social incompetence and inefficiency. Two sections of the community were contributing more than the average quota to the next generation—the neuropathic and the lowest social stratum. To a large extent these two were one and the same. (3) Migration from country to town, leaving inferior stocks to intermarry in rural areas. The mean average incidence of mental defect was as high as 10·4 in rural districts. (4) The migration of defectives from town to country might play a small part.

The next most important matter dealt with in the report was the employability and employment of defectives. Dr. Lewis had found that only 8 per cent. were unemployable. The majority were capable of useful and remunerative employment, an observation amply confirmed by the experience of all well-run institutions and colonies. It was equally certain that the great majority were not earning, and that if defectives were not suitably trained there was little chance of their obtaining and keeping employment. In fact, 56 per cent. of all adult defectives were being supported entirely or partially by public funds. The number so far ascertained by local authorities was only 1·59 per 1000; obviously defectives could not be dealt with until ascertained. A large number were urgently in need of institutional care which was not available, and it was very doubtful whether neglect to provide it was an economy. A considerable proportion, however, were fit to be at large provided they were properly trained and that suitable employment and adequate supervision and control were assured. The similarity between the conditions in 1906 and in 1928 was striking and tragic; something had been done, but very little.

Finally, Dr. Tredgold spoke most gravely of the mistake of publishing Parts I. and II. of the report without Part III., that dealing with adults: the problem was essentially one and must be considered in its entirety. If mysterious influences were at work to delay or prevent publication this was a most serious thing, and totally at variance with national ideals.

Prof. A. M. **Carr Saunders** commented on the report and said he thought the migration townwards was over-estimated; it might be that extremes of all kinds were better represented in the country than in towns. Interesting results might follow careful observation of the creation of new slums by a certain type of householder in surroundings that gave a fair chance of decent life. Slumdom was quite distinct from poverty. Large towns offered casual labour and the chance of "something turning up" to the shiftless defective, conscious of his failure at steady work. Some indefinite industries in large towns were built up on the employment of the inefficient. The report showed that only 11·6 per cent. of defectives were at present earning enough to keep themselves, but it was doubtful whether employment could be substantially increased. Nowadays employees were carefully selected for industries that formerly took hands from the street when wanted. The financial burden of the defective population was usually underestimated. Borderline cases were under no restraint, and they lived in homes where the birth-rate was high; this might more than counteract the effects of segregation and supervision. The full importance of mental defect was not measured in figures; as society progressed so it became integrated, and each defective became a greater drag on normal persons.

Dr. E. O. **Lewis** pointed out that the amount of mental deficiency was the index of a much bigger problem; for every one defective there were 30 persons mentally subnormal in the "social problem" group.—Miss **Evelyn Fox** emphasised the fact that mental defect was a social problem, a failure of adaptation, and urged the necessity of having enough properly trained social workers to help the defective to adapt.—Mrs. **Hudson** (Leeds) asked if there were not some way to remove the stigma of "silly schools," which hindered ascertainment.—Mrs. **Hodgson** (Eugenics Society) pointed out that the differential birth-rate was causing a very great transference of social class and that the lowest degeneracy might be found in rural slums.—Dr. T. P. **Puddicombe** said that no training or supervision would prevent the defective propagating, and the prevention of reproduction was one of the great problems on which public opinion must be sought.—Mr. W. T. **Wright** advocated segregation.—Dr. F. D. **Turner** thought better ascertainment had a great deal to do with the apparent increase in defectives.—Miss **Dendy** illustrated the difficulty of employing high-grade defectives, who were creatures of impulse, able to develop every faculty save self-control. She said that a family history of some kind of defect could be traced in far more cases than at first appeared. The real criterion of defect was not ability to acquire knowledge, but ability to make use of knowledge.—Dr. **Tredgold**, in reply, said that the prevention of marriage among defectives was very important, though it would not by any means stop the birth of defective children.

On Friday morning the chair was taken by Mr. **Morgan Jones**, M.P., and a discussion took place on the report, with special reference to

Educational and Administrative Problems Concerning Defective and Retarded Children.

Prof. **Cyril Burt** said that the criteria and standards laid down in the report were no more severe than those normally followed, and they showed that there were *roughly 90,000 defective children in the country*. The number in special schools was one-sixth of this and it was impossible to enlarge the special school system to meet the need. Moreover, these 90,000 were but the tail end of a far vaster group of borderline cases, nearly but not quite certifiable. There was no line of cleavage between the dull normal and the feeble-minded. The dull and backward were not deriving proper benefit from ordinary school instruction. The emphasis hitherto had been laid on the defectives, and their claims had overshadowed those of the borderline group, who amounted to 10 per cent. of the whole school population in towns and 15 or 20 per cent. in rural areas. From among these came most of the paupers, criminals, and ne'er-do-weels. Proper provision for the dull and backward was therefore one of the most urgent educational needs of the day. Once they were provided for, the feeble-minded would take their natural place at the tail end of the larger group. The two groups should be dealt with by one scheme. A large proportion of so-called defective children were incompetent pupils *rather than incapable citizens, and were de-certified* when school days were over. It was not fair to stigmatise them by certification and inclusion in a class with low-grade cases who would need permanent supervision. The committee therefore recommended abolition of the certificate; special schools would thus become an organic part of the general system of the public elementary school. Differentiation was more important for the older children. The local education authority would be responsible for all retarded children (except extreme cases) under the age of 11. At 11 there would be a general survey of all children to decide on the best form of post-primary education for each individual. Those who had made no progress in manual and scholastic work would be notified to the M.D. authority, which would thereafter be entirely responsible. Thus children in schools for the retarded would not be brought into contact with low-grade or detrimental children, while special classes would *become an essential part of the general scheme for* post-primary schools. There was urgent need for further research into the efficacy of different methods of instruction, and the way to deal with the temperamental, word-blind, emotional, or excitable child.

Dr. R. H. CROWLEY said that the report enabled us to see unity in much diversity and provided a solid foundation for building. The problem had become static and hampered by its framework. The idea that mental defect was a difference in kind rather than in degree had hindered progress more than any other factor. Defect was important in the light of behaviour and social adaptedness and not in itself. The early years should be allotted to probation and salvage, while at the age of 11 special consideration would be given. Many defective children were not detrimental to others and could derive benefit from a day school junior department. The "ineducable" would be notified to the mental deficiency authority, but it would be the *duty of the education authority* to provide occupation centres for them. Great development was needed in the practice of educational psychology. Boarding-school accommodation should be considered for other children than those requiring permanent institutional care; this would be costly and would require a most careful system of after-care. There should be very adequate classification, as mixing might prove most unfair to high-grade children. The maladjusted, difficult, and unstable child also called for a steady development of educational psychology, and the solution of many social problems was bound up with an effective analysis followed by appropriate action over a long period of years. Failure in behaviour stood out more than failure in intellect. It was upon the mind in its emotional aspects that concentrated thought and action was required.

After some questions had been asked and answered Miss COLLINGWOOD criticised the report as too elastic in its recommendations; the "dull and backward" local authorities would be able to quote it as countenance for continuing to do nothing. In certifying a child as feeble-minded a doctor was using a purely educational diagnosis which did not lie within the medical sphere at all. Certification was little if anything to do with the parents' objection to special schools. They resented dealing with the child by any but the prescribed means, and always would resent it. Mental defect was recognisable soon after 7, *and to delay notification until* 11 was to waste the time of teacher and pupil and to encourage bad habits.

Miss MARTINEAU (President, National Special Schools Union) thought that the same authority should deal with the child right through. Certification, if given up, must be replaced by something equally effective; the word of the educationist would not have the magic spell of medical authority. Parents would object to special schools whatever name was given to them.

Dr. THOMAS BEATON said that the primary trouble was sociological, and doctors had only come into the discussion because they were interested in behaviour problems. Behaviour was the basis of sociological trouble wherever it arose. So long as the child behaved fairly well the doctors were very willing that the teachers should use any device they could to try to help it to grow. No one yet knew the best way, but it was certain that some effort should be made to keep the retarded patient a child for a few more years than the normal individual. There was too great a tendency to treat the child as a unit, whereas everyone was a part of the environment. It was essential to bear in mind what forces were at work in the child's mind, for the reactions it showed depended not only on its own make-up, but also on the pressures which were forcing it. Magistrates tended to rely on probation, which was a serious mistake, for it failed to alter the environment. A primary effort should be made to alter the young delinquent's environment in such a way that—without imposing too great stress—it maintained a standard of conduct which would give him self-respect and satisfy him in his struggle for existence. Pure medicine, individual psychology, and education were all alike useless.

Mr. R. C. MORRISON thought that the most important thing in the report was the new educational unit for retarded children, and pressed for the publication of Part III.—Mr. J. HUDSON (National Special Schools Union) said that it was not sufficient to concentrate dull and backward children into special classes or give them a few special lessons; at least half their time should be spent in handicrafts.—Mr FLAVELL believed that mental defect could be eradicated in a generation if sexual intercourse between defectives was stopped, and Mr. OLIVER pleaded for a single authority.

On Friday afternoon the chair was taken by Prof. T. P. NUNN, and Mr. C. J. R. TIPPER read a paper on an experiment in the

Education of Retarded Children in a Rural County.

In Westmorland, he said, the sparseness of the population was illustrated by the fact that there were 5200 children among 110 schools, and that the average attendance was less than 50 in 69 schools. There was no centre for a day school or class and a residential school was out of the question. The method tried, therefore, was to have one visiting teacher specially trained to assist teachers in devising and adapting methods for these children. Of the 450 retarded children 133 were classified as dull and backward, 39 as mentally defective, and the others were retarded through some removable cause. Many children from remote parts heard little conversation and saw few books at home, and might give a false impression of stupidity at first. Classification was made with the help of the school records, the school medical officer's report, a special report by the head teacher, and the family history, together with Binet-Simon, Burt's, graded reasoning and performance tests. The work now covered 28 children in 14 schools and two large groups for special work. The probable educational or mental age of the child at leaving was forecast and work was so arranged that the child would be doing the maximum of which he was capable by the time he left. (The scheme drawn up might be borrowed by interested teachers.) A good deal depended on the organisation of the class; it was much easier to arrange special work when individual teaching was the rule to a large extent already. The results indicated that dull and backward children could make decided progress in an ordinary elementary school where suitable methods were used and a teacher had guidance from someone who had specially studied the subject. The influence of other children was for the good of the backward child, and he was seldom ill-treated. He was much happier if making progress than if marking time.

Miss K. L. MARSDEN read a paper on the organisation of

Classes for Retarded Children.

In Nottingham, she said, every child of 7 had a simple mental test for classification of his mental age, as normal, subnormal, or possible defective. In 1927 the normal had numbered 4681, the subnormal 438, and the defective 137. The two latter classes were specially tested in greater detail and drafted to the class most suitable—e.g., open-air recovery school, special school, or special classes for probation called "practical classes." Nervous or convalescent children put into a class of 60 might be utterly lost, but in a class where individual or small-group teaching was given would do well and soon be fit for transference to a normal class. Provision was not yet adequate for the number of "retarded" children in our schools, and until they were properly taught we were wasting their limited mental power and also the ability of children who could get on faster if not taught together with the slow. The classes for the dull and backward were as much a part of the school as any other, and the children mixed with others at play and in singing, needlework, and other classes. Records were kept of each member of the practical class, and any marked ability was encouraged. About 10 per cent. returned to normal classes, but the numbers varied considerably.

Mgr. T. A. NEWSOME read a paper on experiments in the

Education and Training of Retarded Children.

His work, he said, was based on 12 years' experience of mentally defective boys at Besford Court. The small institution must not be conducted on the "menagerie" principle, but must receive only patients whose mental defect falls within a certain definite range. For low-grade defectives who would spend their lives in a colony, education in the three R's was waste of labour and money. For higher-grade patients, to whom it was proposed to teach a useful trade for eventual return to the community, the teaching of the three R's absorbed most of the time needed for learning the trade. The junior department at Besford Court (for boys aged 7–12) had therefore been transformed into a Montessori school, with great success. The increased enthusiasm was marked and careful observation of mental ratios showed that the final results of this system were really excellent. The achievement ratio of boys of the Montessori department had been raised from 79 to 98 per cent.—i.e., their actual educational attainment was 98 per cent. of their native ability. The salient feature of the Besford Court system was that reading, writing, and arithmetic were merely the foundation for the real training. However proficient in these subjects a child might be rendered by special methods he was still defective in the true sense of the word, and his defect must be compensated by intensive training in some craft. In a custodial home shoemaker's and tailor's shops and gardening departments were run by experts with mentally defective assistants, but it was extremely debatable whether these occupations trained defectives to earn their living later on in these trades. Shoes and garments to-day were factory-made, and tailoring was an unhealthy trade for defectives, who were not, physiologically, healthy people. In the custodial home economy of working and healthy, happy employment were the first considerations, but the special school had a totally different aim. The most gratifying results had been obtained at Besford Court in training defective boys to be as proficient at certain crafts as normal workmen. The trades, in the order of the mental ratio required,
to [illegible] painting (lowest), rural handicrafts, gardening,
serious [illegible] bricklaying, and skilled carpentry. The
ideals. [illegible] was of losing the individual in the
Prof. A. M. [illegible]tient must have special study and
[illegible]port and said h[illegible] special treatment. One faculty might become exhausted and another might suddenly begin to develop.

Character defects might be innate or acquired, and the two types needed quite different treatment. The cause of bad conduct must be ascertained in every case, and the child must be regarded as a patient and not a culprit. The residential school was to the child-guidance clinic as a well-conducted hospital to the specialist's consulting-room, and should be a research centre with detailed records and opportunities for conference. Mgr. Newsome described the method by which cases were studied and discussed at Besford Court. It was almost invariably the rule that conduct disorders showed their first signs of improvement in the report of the manual instructor, revealing the close association of conduct disorder with inferiority complex. The other important association with conduct disorders was physical ill-health. Open-air life and ultra-violet light had proved useful, but a number of cases seemed likely only to be understood by a study of endocrine imbalance.

Questions and discussion followed.

MEDICO-LEGAL SOCIETY.

AT a meeting of this Society held on April 25th the chair was taken by the President, Sir WILLIAM WILLCOX, and Lord RIDDELL read a paper on

STERILISATION OF THE UNFIT.

He pointed out that there were 138,293 notified insane persons and 61,522 defectives in England and Wales in 1927 and that 3047 of the former had been discharged "relieved, but not recovered," while on an average 600 were allowed out every day on parole in an unstable mental condition. The institutional accommodation for mental defectives fell short of requirements by some 18,038. He quoted examples, given by the Board of Control and other authorities, of the families produced and the crimes committed by defectives. The Board deprecated the marriage of defectives, but refrained from stating that the sexual instinct was very powerful among these people and that they would go to any lengths to give expression to it, being oblivious of results or sanctions and very prolific. The colonies recommended by the Board to fulfil their policy of segregation would cost enormous sums; could the community afford to spend 20 millions on a section of the population of the worst type? The abnormal citizen already received far more care and attention than the normal one. No one suggested that sterilisation was a complete solution of the problem, but it would reduce the necessity for segregation and consequently the expense. The Board said that "the life of the colonists approximated to village life"; it would be interesting to know if the authorities had discovered methods of damping down the normal sexual impulses of the colonists. The Board failed to give due prominence to the strength and permanence of the sexual instinct in certain classes of defectives. The propagation of undesirables was a national menace and the condemnation of high-grade defectives to celibacy was unjustifiably cruel. They produced bad stock and made bad parents, but sterilisation would cover both these objections. The existing system was incoherent and illogical; on the one hand the Board were demanding more institutions, and on the other their policy was to return as many lunatics and defectives to the outside world as possible, thus providing opportunities for them to breed more defectives and more criminals. Sterilisation would endow the parole-discharge-and-licence policy with more freedom and more safety to the community and would tend to reduce the multiplication of the mentally diseased. The operation would only be performed with the consent of the patient, or—if incapable of consent—of the parents or guardians, and would increase rather than restrict the liberty of the individual and of his or her mate. Individual liberty was constantly being restricted for the safety of the community, as in vaccination and segregation for infectious disease. Sterilisation would not increase promiscuity and venereal disease; the sterilised would still be under supervision and the operation would leave their inhibitions—if any—unaffected. The operations were not dangerous and did not affect the sexual functions. In California 3232 vasectomies and 2588 salpingectomies had caused only three deaths—two from the anæsthetic and one from premature removal of dressings by the patient. The results had been highly satisfactory in California and compulsory sterilisation had now been prescribed by law in one of the Swiss cantons and in Alberta, Canada. At present the interest and happiness of the individual patient were put before the general interest of the community; the whole subject required statesmanlike attention.

Discussion.

A letter from Lord **Atkin** was read, suggesting discussion of the following points: selection of patients and who should make it; what consents, if any, were to be required; whether there should be any judicial or other appeal; whether incurable cases only should be sterilised; at what age the operation should be performed; and whether the patient must show some propensity to bear or beget children.

Dr. F. J. **McCann** said that sterilisation was of little or no value; his objections were that it did not affect the source of supply, that it did not make the unfit clean, sober, righteous, or worthy, that it returned to society sterilised persons liable to transmit venereal disease, and that the sterilised would still require supervision. Sterilisation was very attractive to those who had a superficial knowledge of the problem. Half the defectives born were begotten by parents who were not defective and, if alcohol, syphilis, and other germ-plasm poisons were eradicated. more would be done for the race than by any other means. Nature had her own way of eliminating the unfit; defectiveness appeared earlier in each generation, so that insanity became imbecility in three or four generations, and there was a high percentage of developmental defect in aborted ova. It was exceptional for the feeble-minded to marry into healthy stocks. The surgical results claimed by enthusiasts were hard to justify, and he did not believe that no change in testis or ovary followed sterilisation. The subject of heredity was so little understood at present that no one could decide which cases were suitable for sterilisation. Where segregation was permanent and supervision close all the advantages claimed for sterilisation were obtained without it.

Dr. R. A. **Gibbons** said that sterilisation offered an effective means of preventing the birth of an enormous number of defective children, 70–80 per cent. of whom owed their condition to neuropathic heredity. Most people agreed that nothing could be better than thorough segregation, but it was quite impossible to segregate all our defectives. Sterilisation was complementary and not alternative to segregation. Paul Popenoe in California had found no evidence whatever that sterilisation played a part in increasing sexual delinquency or venereal disease. In 21 years 23 States had adopted sterilisation laws. After discussing the legal implications of a sterilising operation, Dr. Gibbons urged the importance of preventing the marriage of defectives. When there was no hope of improvement sterilisation ought to be compulsory, like vaccination, but no operation should be performed without the consent of the Board of Control. If the consent of the patient or his parents were required it would be a long time before advance was made.

Earl **Russell** was appalled at the large sums being spent on these comparatively useless members of the community while the healthy and useful were in great need. It was worth while, he said, to pay some attention to the healthy as well as to the diseased, and employment and proper housing were quite as important as the treatment of defectives. Bricks and mortar should be provided for those who did not yet and might never require institutional treatment. Dr. McCann had said that Nature eliminated the mentally unfit in time, but could not we do something to help Nature? Voluntary sterilisation would not do much; even parental consent would not be easy to get if the parents were usually unstable people. If supervision were to prevent sexual intercourse it would have to be as close as in an institution. Too much attention was paid to the sick and too little to the healthy; we should encourage the breeding of healthy stock. Sterilisation of the obvious case was a very small infringement of personal liberty.

Dr. **Nathan Raw** said that the increase of insanity called for preventive measures. Segregation would be satisfactory, if it were possible, but sterilisation was the only feasible method for certain cases. It should be carefully safeguarded and the consent of the guardians or of the Board of Control or some authority should be required. It was the only scientific remedy we could apply to redress this great burden on the State. At first it should be advocated only for the weak-minded boys and girls who reproduced freely, without really being responsible.

Dr. T. B. **Hyslop** reviewed his experience and thought the progress of sterilisation had been delayed by fetish-worship of the liberty of the subject. He thought consent of both patient and relatives ought to be obtained to guard the operator against subsequent legal action.

Dr. **Temple Gray** was convinced that Nature knew quite well how to look after evolution without the intervention of Boards of Control. It was not true that defectives were disastrously prolific; while their birth-rate might be a little higher than that of others, their death-rate was five times the normal. "Consent" from a mental defective was a contradiction in terms.

Lord **Riddell**, in reply, contrasted the economy talk with the enormous expenditure proposed by the experts in mental defect; if the nation was not going to spend this money, what was it going to do? Were we going to sit down quietly and let the race be poisoned and crippled in the markets of the world? Was it right, with housing conditions what they were, to contemplate spending 20 millions on a class of people who would never be any use to the nation, and to keep mental defectives at 42*s*. a week when normal children were being taught in classes of 60 and kept under utterly unsuitable conditions?

MANCHESTER MEDICAL SOCIETY.

At a meeting of this Society, held on April 3rd at the Manchester University, with Dr. R. W. **Marsden**, President of the Society, in the chair, Dr. **Charles H. Melland** read a paper on the

Treatment of Pernicious Anæmia by Liver.

Dr. **Melland** gave an epitome of his experience of the treatment of some 40 cases of pernicious anæmia by liver in the last two years. With certain exceptions the results were almost uniformly good, but it is too soon yet to say definitely how much better than the older methods of treatment. These older methods, if effectively handled, were undoubtedly very successful in many cases, and Dr. Melland gave instances of patients who had lived for 17, 9, 8 years, and so on, with more or less complete freedom from symptoms over long periods, as the result of treatment by such methods. In order to achieve such results, however, very great care in carrying out the details of the treatment was called for, and it was often difficult to secure this careful attention, with the result that relapse and early death was only too common. Although it was too soon as yet to draw final conclusions, Dr. Melland was of opinion that the addition of the liver treatment to the older methods was undoubtedly of the greatest value, the results were attained more speedily, the recovery was more complete, the improvement was maintained more easily, and with much less tendency to relapse.

NORTH OF ENGLAND GYNÆCOLOGICAL AND OBSTETRICAL SOCIETY.

AT a meeting of this Society held at Liverpool on March 15th, with Dr. G. W. FITZGERALD, the President, in the chair, a paper on the

Pathology of Cervicitis

was read by Dr. K. V. BAILEY. He had examined 850 specimens of the cervix uteri, he said, with a twofold object—namely, to ascertain the precise pathology of the so-called cervical erosion and with a thorough knowledge of this pathology as a basis, to inquire into the problem of the inception of cervical cancer. The present paper dealt with the pathology of cervicitis, of which he distinguished two types: (1) The relatively unimportant and rare condition of congenital erosion seen in the nulliparous and presumably non-infected cervix. Reel had described this condition and thought it was due to anomalous growth of the mucous membrane lining the cervical canal. In the speaker's series this type showed definite inflammatory reaction, and therefore there was no reason to differentiate it from the inflammatory type. (2) The large group of inflammatory erosions. Dr. Bailey believed that the life-history of this condition fell into four distinct stages.

Stage 1.—The primary effects of irritation. This was characterised microscopically by the stripping off bodily of the squamous epithelium at the level of its lowermost cells by large and small blood cells and the inflammatory exudate as a whole.

Stage 2.—Epithelial reaction to inflammatory irritation. Proliferation and repair. Microscopically the evidences of inflammatory reaction are definitely lessened. The surface exudate is less and intimately associated with the new surface epithelial covering which is identical with and derived from the columnar epithelium lining the cervical canal.

Stage 3.—Replacement of columnar by squamous epithelium on the surface of the affected area. In this stage the squamous epithelium grows over the affected area by new cells growing from the basal layer of the nearest unaffected squamous epithelium upwards towards the adjacent columnar epithelial surface and lifting the single layer upwards lever fashion, thereby gradually replacing it. In this stage tissues immediately beneath the columnar epithelial layers are greatly rarefied.

Stage 4.—The stage of ultimate healing. This stage is characterised by the presence of dilated gland spaces situated beneath the new covering—the result of mechanical blocking of their ducts by the squamous cells. Pseudo-malignant appearances result from irregular downgrowths of squamous cells, especially in connexion with the mouths of dilated gland spaces.

Dr. Bailey had found 42 examples in his series of a true ulcerative erosion of the cervix which was pathologically akin to the condition already described. The affected area was depressed with overhanging epithelial edges in immediate contact and a smooth granular depressed base coated with chronic exudative material. It was a condition relatively common in association with the damaged and hypertrophied cervix usually removed during the operation for uterine prolapse. He suggested that from the pathological standpoint the term "erosion" was erroneous, and he proposed that the group of cases known as erosion (papillary, follicular, &c.) should be called "peri-oricular cervicitis," that true ulceration of the cervix should be termed "ulcerative cervicitis," and that infection limited to the cervical glands should be called "glandular cervicitis."

The Cæsarean Scar.

Prof. W. BLAIR BELL showed a specimen of a uterus with scar of a Cæsarean wound. The specimen was obtained at the post-mortem examination of a patient who died a few hours after an emergency Cæsarean section. It clearly demonstrated, Prof. Blair Bell said, the result of the procedure he had advocated and described.[1] The strong, heaped, muscular scar, the absence of catgut on the peritoneal and mucosal surfaces, and the complete apposition of the parts were revealed. The question of rupture of the Cæsarean scar had often been discussed and cases had been admitted to the Royal Infirmary in the last few years of both rupture and impending rupture. Prof. Blair Bell knew of no case of his own in which such conditions had supervened. It was, of course, obvious that infection in a scar might be responsible for imperfect union, but he was convinced that the method of suture was of paramount importance whether in clean or infected scars. An unpunctured, accurately apposed mucosa, and wide muscular union, as shown in the specimen, must be of importance. Furthermore, the absence of suture material projecting on the peritoneal surface removed or reduced a constant source of omental and intestinal adhesions.

The PRESIDENT stressed the necessity for accurate opposition of the edges of the scar. He said that his method of suture was similar to that of Prof. Blair Bell except that he did not use the mattress suture. A patient of his had had a rise of temperature after an emergency Cæsarean section. She did not report on her next pregnancy, but delivered herself normally. In the third pregnancy the scar ruptured.

Miss FRANCES IVENS said that she avoided the endometrium in sewing up her scars and used two layers of catgut, the last layer taking in a large bit of uterine muscle. She had had an opportunity of studying one of her scars five weeks after Cæsarean section. The patient had fibroids and as conditions were not suitable for hysterectomy at the time of the Cæsarean section the uterus was removed five weeks later. The uterus showed that the scar was thicker than the rest of the uterine wall and microscopically its track could be traced by a line of giant cells.

Prof. BLAIR BELL replied that a badly sewn wound was more likely to rupture afterwards even in the absence of infection.

A Case of Ovarian Tumour.

Prof. W. BLAIR BELL also showed two specimens, one of which was from a case of ruptured papillary ovarian tumour.

The patient was a single woman aged 35. Eighteen months previously the left ovary had been removed by Dr. Leith Murray, being the seat of a growth similar to that now described. It appeared malignant macroscopically, but on section was regarded as innocent. Two pints of fluid (not blood-stained) were evacuated from the abdomen, due to rupture of the upper pole of the tumour before operation.

In January, 1929, she was admitted to a medical ward with abdominal swelling, dyspnœa on exertion, swelling of the ankles, and loss of weight. One and a half pints of fluid were aspirated from the right pleural cavity, but there was no evidence of tuberculous disease. A week later eight pints of fluid were withdrawn from the abdomen by paracentesis. Eleven days later laparotomy was done under spinal anæsthesia and two pints of thick, straw-coloured fluid were evacuated. The growth of the right ovary was slightly adherent posteriorly and the uterus was displaced to the left. It was not removed on account of the condition of the patient. There were bands running over the growth which had the appearance of adherent intestine and omentum.

The growth was also cystic in several places, but its general appearance was that of a friable, soft, solid malignant tumour. Histologically it was a papillary adenoma.

ABERDEEN MEDICO-CHIRURGICAL SOCIETY.

REPORTS OF CASES.

A MEETING of this Society was held on April 4th, with Prof. ALEXANDER LOW, the President, in the chair.

Dr. WILLIAM BROWN reported two cases of Erythrœdema Polyneuritis (Pink Disease). They illustrated, he said, the following points: change in temperament and expression; swelling of the face and the high colour of cheeks and nose; the presence of stomatitis; desquamation of hands and feet, with tenderness; and the characteristic attitude in bed.

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[1] Jour. Obst. and Gyn. Brit. Emp., 1925, xxxii., 727.

The two chief signs of the disease were the look of "misery" and the colour of the hands and feet. Both cases had been admitted with a history of change of temperament and of depraved appetite, sweating, redness and coldness of extremities. One case was in hospital for four months and the other for two months. Both were treated with a diet rich in vitamin B in addition to general tonic treatment. Marmite was given in large doses. One case improved rapidly on receiving ultra-violet rays. Calcium was given to both cases. Dr. Brown mentioned the similarity, in some respects, between this disease and beri-beri and pellagra, especially the latter.

Dr. J. F. CHRISTIE described a case of ecthyma which, he said, was really a deeper form of streptococcal impetigo, although sometimes a deep tuberculous focus was concerned in the ætiology. The children were usually in poor condition and the buttocks, thighs, and legs were most commonly affected. The best applications were either a 1 per cent. solution of silver nitrate or 1/2000 solution of mercuric chloride. In the present case the child made a good recovery, but returned to hospital three weeks later with broncho-pneumonia. Six weeks after convalescence the patient was readmitted and died of generalised tuberculosis.

Dr. Christie also described a case of pemphigus vulgaris in a male child aged 3 years. It was of note that the infant had suffered from chicken-pox three months previously.

Typical bullæ appeared on the arms, backs of the hands, genitals, and adjacent parts of the thighs. The bullæ came out in crops without much rise in temperature, and with no itching. A polymorphonuclear leucocytosis was present with 7 per cent. eosinophils. Condy baths were prescribed and an ointment containing hydrarg. ammon. and ichthyol was applied. Increasing drop doses of Fowler's solution were given by mouth. There was no improvement after a month and quinine sulphate was then given. Later, on withdrawing serum from what appeared a sterile bulla, an almost pure culture of a hæmolytic streptococcus was found. Antistreptococcal serum was then injected, in all five doses at seven days' intervals.

Bullæ still continued to form with slight rises in temperature, but at the end of five weeks the child was considerably better and left the hospital with no signs of any skin affection.

Dr. H. ROSS SOUPER described the appearances and course of a case of acute suppurative frontal sinusitis in a girl aged 10.

There was marked swelling of both eyelids and bilateral proptosis and a fluctuating swelling was present in the mid-line of the forehead. A skiagram showed well-marked opacity of both frontal sinuses with necrosis of the supraorbital ridges. At operation pus was found superficial to the frontal bone, both frontal sinuses were filled with pus, and abscess cavities extended through the roof of both orbits. Part of the frontal bone was necrosed and removal exposed the dura mater. Free drainage was established, but the patient died next day. A staphylococcus was isolated from the pus.

Dr. Souper also described a case of lateral and cavernous sinus thrombosis in a boy aged 3.

On admission the child had a temperature of 100·2° F. and slight left otorrhœa. There were no definite external signs of mastoiditis. Two days later œdema of the left eyelid appeared, followed by œdema of the right eyelid the next day. The temperature rose to 103° and a polymorphonuclear leucocytosis of 43,000 was present. At operation necrosis of the mastoid cells was found. The lateral sinus was found to be covered with granulations and contained a clot which was removed. The patient received antistreptococcal serum, but died the following day.

Dr. Souper discussed a series of 22 cases of tuberculous mastoiditis in children. The condition occurred between the first and third year of life, was insidious in onset, and the facial nerve was often involved. The discharge from the ear was curdy and flaky and multiple perforations were often present; early glandular involvement occurred and the pre-auricular glands were especially implicated.

Dr. JOHN CRAIG showed several cases including one of cœliac disease in a girl of 6½ years, who had a history of diarrhœa for several years with the passage of large, loose, pultaceous stools. She had been fed as an infant continuously on a proprietary food. The appearances of the case were classical—infantilism, large abdomen, thin flabby limbs, wasted buttocks, with the usual quaint introspective mentality and squeaky voice. Skiagrams showed many transverse striations of the ends of the long bones.

Reviews and Notices of Books.

THE DIAGNOSIS AND TREATMENT OF GONORRHŒA.

Diagnostic et Traitement de la Blennorragie. By Dr. JULES JANET. Paris: Masson et Cie. 1929. Pp. 536. Fr.60.

A COMPREHENSIVE volume on gonorrhœa from the pen of Dr. Janet, one of the pioneers of treatment by urethro-vesical irrigation whose experience of this disease is unrivalled, has long been eagerly anticipated.

By far the most valuable feature of the volume is the wealth of practical detail concerning the technique of treatment by irrigation. The danger of injury to the delicate urethral mucous membrane in the acute stages of the disease by instrumental treatment or by irrigation at an unduly high pressure is carefully considered. Dr. Janet is emphatic in stating that during urethro-vesical irrigation the relaxation of the urethral sphincter should be the result of gentle and skilled persuasion and not of force; the maximum head of fluid used should never exceed a metre. The retention of potassium permanganate solution in the bladder after irrigation is strongly condemned on account of the precipitation of insoluble manganese dioxide which takes place. With regard to the controversial question of when irrigation into the bladder should be commenced, Dr. Janet's practice is to confine irrigation to the anterior urethra only during the early stages; when there is evidence of infection in the posterior urethra, and not until then, urethro-vesical irrigation is advised. Irrigation is continued even in the presence of acute prostatitis, although the concentration of the solutions used is reduced. Amongst the various tests of cure, which are fully discussed, considerable importance is attached to the examination and cultivation of the semen; the author has not, however, found this method to yield positive results in chronic infections in the high proportions quoted by many other authorities. The instrumental treatment of chronic gonorrhœa in the male receives but a brief description; the urethroscope is considered of value only in unusual cases. A particularly interesting and well-illustrated chapter describes the treatment of infection in the various types of para-urethral ducts. The section on the diagnosis and treatment of gonorrhœa in women conforms closely to generally accepted practice; the author's outlook on the likelihood of cure in chronic infections is pessimistic. The secondary infections of the female genital tract are believed to be quite as dangerous as the primary gonococcal infection and never to undergo spontaneous cure, whereas in males this termination after a time is not infrequent. Chronic gonococcal infections are held to be the cause of three-quarters of the gynæcological lesions in women.

This volume will be of value to all practitioners who treat gonorrhœa by irrigation.

EPILEPSY.

By WILLIAM G. LENNOX, M.D., Research Fellow in Neuropathology, Harvard Medical School; and STANLEY COBB, M.D., Bullard Professor of Neuropathology, Harvard Medical School. London: Baillière, Tindall and Cox. 1928. Pp. 197. 16s.

WHATEVER be the exact or appropriate connotation to apply to the term epilepsy, and whether it is a disease or a symptom, little advance has been made in knowledge of the subject of recent years, notwithstanding our claims that we know a great deal more than the preceding generation. It is a reproach to medicine that this should be true, for epilepsy is common, often distressing, turns up in unexpected quarters, and its prognosis is always uncertain. This being the case, a survey of the precise situation and of the lines of approach is sure to be useful. This has been provided by Dr. Lennox and Dr. Cobb, of the Harvard Medical School; their monograph is proof not only of their wide acquaintance with an enormous literature but also of their selective skill and critical acumen. They have wisely eschewed controversy and have been content to point out contradictions without entering the lists themselves in a challenging fashion; yet the reader will soon appreciate the fact that when they adopt any particular attitude of clinical or pathogenic interpretation they have reason on their side.

Theories of the actual neural mechanisms involved in convulsive seizures are epitomised, and such evidence as pathology affords is fully examined. In proper sequence the action of possible factors outside the nervous system itself is carefully set out; these factors range from circulatory and blood states to the endocrines. Particular attention is concentrated on the long series of biochemical investigations that have been applied to epileptic problems; all sorts of metabolic researches, concerned with proteins, fats, carbohydrates, with acid-base relationships, with alkalosis and acidosis, have been scrutinised in the hunt for promising lines of advance. Only a minor section of the monograph deals with the more practical aspects of prophylaxis and treatment; yet after all this is only as it should be, since treatment has never yet passed the empirical stage. A bibliography occupying some 30 pages contains, we estimate, some 700 references.

All that is known about epilepsy is here, at least all that is worth knowing. The book furnishes the serious student of the subject that *mise au point* which, we believe, may be a stepping-off place for further exploration.

NOSE, THROAT, AND EAR.

The Care of the Nose, Throat, and Ear. Second edition. By W. STUART-LOW, F.R.C.S. Eng., Consulting Surgeon to the Central London Throat, Nose, and Ear Hospital. London: Baillière, Tindall and Cox. 1929. Pp. 90. 5s.

THE second edition of this book includes a short account of the ear. It has been written for the general public, and those of the laity who desire a smattering of knowledge of the nose, throat, and ear, and their diseases will find what they want in its pages. The author of a work of this kind is necessarily dogmatic and must find it difficult to avoid occasional exaggeration. Certain statements may be quoted which err in this direction, such as "if the nose is blown properly when a cold in the head is in its early stages its development can be stopped." Of hay-fever the author states that "the nose is at fault in all such cases, and should have skilled examination and attention to effect a cure, which can be brought about in all instances." He also says that it is now recognised that a large majority, if not all cases of asthma, are dependent upon some nasal obstruction or disturbing condition of the nasal cavity. Such over-statements are misleading.

Notes on Otorrhœa, with Especial Reference to the Use of Zinc Ionisation in the Treatment of Selected Cases. By A. R. FRIEL, M.A., M.D. (Univ. Dub.), F.R.C.S.I., Assistant Aurist, School Medical Service, London County Council. Bristol: John Wright and Sons. 1929. Pp. 88. 6s.

THIS is a careful and lucid account of the treatment of chronic aural suppuration by zinc ionisation given by a well-known exponent of the method. The first part of the book is occupied by a clear elementary statement of the physics of ionisation with an account some experiments illustrating the action of zinc ionisation on albumin and bacteria. The apparatus employed might well have been described at greater length. The most important section of the book is that concerned with the technique of treatment by ionisation as applied to chronic otorrhœa. Here a notable feature is the attention which Dr. Friel pays to the appearance of the tympanum and to the details of treatment. There is little doubt that many cases of suppuration would be cured by the careful syringing and instillation of zinc sulphate, which is preliminary to this treatment, without the ionisation, but the use of ionisation makes the cure much quicker, and this renders the method particularly valuable in school clinics. Ionisation is successful only if undertaken with scrupulous care, and this exposition will be of value to all who make use of this form of treatment.

FORENSIC MEDICINE AND TOXICOLOGY.

By the late Dr. FRED J. SMITH. Third edition. Edited by Dr. GEORGE JONES. London: H. K. Lewis and Co., Ltd. 1929. Pp. xx. + 440. 10s.

THIS book makes no pretence to being an exhaustive treatise on legal medicine, but was compiled as an epitome of the lectures given at the London Hospital Medical School, with which institution the late author was and the editor has long been associated. Into its 440 pages has been collected a surprising amount of material of the greatest use to students preparing for examinations.

The book has been carefully revised by Dr. George Jones, who has interpolated a considerable amount of new matter. The whole range of forensic medicine is covered, though lack of space has prevented sometimes an adequate presentation. Many of the descriptions are doubtless amplified in the lecture and post-mortem theatres of the London Hospital. In future editions more of the original text might be eliminated, and the space thus obtained utilised to expand the more technical side of the teaching.

THE CHILD OF CIRCUMSTANCE.

By ALBERT WILSON, M.D. Edin., late President of the Royal Medical Society of Edinburgh. London: John Bale, Sons and Danielsson. 1928. Pp. 420. 15s.

THIS book occupied the energies and interest of the late Dr. Albert Wilson almost up to the day of his death. It covers the varied aspects of criminology, is rich in personal experience, and marked by definite opinions upon such matters as capital punishment and the lash, both of which the author would retain though substituting the lethal chamber for our cruder method of carrying out the former. Yet his humanity and his understanding of the wrongdoer find expression throughout, and he reminds us again and again of the good work done by the Quakers and the Salvation Army in the direction of helping the criminal, both by alleviating unnecessary suffering and aiding reform. The penal systems of Europe and America are described in the light of modern knowledge, and this part of the book is itself a mine of information.

It is a commonplace of scientific history and not a reproach to the writer that he has not readily assimilated some of the new ideas now freely accepted, and it must be admitted that his criticisms of the psychological teachings of McDougall and Freud—which he wrongly treats as identical—belong to the past. But his book is the product of a vigorous and humane personality ripened by long experience, and its varied contents will interest the reader, whether he be a layman or a doctor.

IN the review of the second edition of "Regional Anæsthesia." by Gaston Labat, M.D. (W. B. Saunders), last week the number of pages should have been 567, and the price 35s.

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THE LANCET.

LONDON: SATURDAY, MAY 4, 1929.

THE COSTLINESS OF RADIUM.

THE National Radium Fund was opened on Monday last in response to a letter in the *Times* signed by the heads of the medical profession and by certain distinguished laymen closely connected with institutions where cancer is being treated with radium. The letter, which we print in full on p. 937, indicates how great and urgent is the need, and appeals for £150,000 to purchase radium on a scale adequate for the present and the near future. For every £1 subscribed the Government will grant £1 up to a limit of £100,000, bringing up the total sum available to £250,000. The Fund is regarded as an impressive way of commemorating the thankfulness felt by the Nation for the KING's convalescence after his dangerous illness. At the same time was announced an anonymous donation of 100,000 guineas to King Edward's Hospital Fund for London as a nucleus for a large thank-offering fund which is also to have the Earl of DONOUGHMORE as its treasurer and the same office organisation. Gifts to this second Fund may be earmarked for the purchase of radium through the National Radium Fund. The Keeper of the Privy Purse indeed writes of the two funds as having now been amalgamated. The constitution of the Radium Commission, which is to deal with the custody, distribution, and use of all the radium purchased and held by the Trustees of the Radium Fund, has now been more clearly defined. It is to consist of a chairman appointed by the Trustees and not necessarily a medical man; four representatives nominated, one each by the Minister of Health, the Secretary of State for Scotland, the Medical Research Council, and the Department of Scientific and Industrial Research; and six members to be appointed by the Trustees from a panel to be nominated by the occupants for the time being of the offices of, among others, President of the Royal College of Physicians of London, President of the Royal College of Surgeons of England, President of the Royal Society of Medicine, and President of the British Medical Association. The constitution of the Radium Commission thus provides for an effective majority of members representing the skilled and experienced workers on the staffs of the voluntary hospitals. The Commission, it is stated, is also to have the right of nominating two of the Radium Trustees.

The need for this elaborate care is a measure of the new problem in medicine set by the intrinsic value of radium element. Most of the cost of medical treatment in the past has been the price of the physician's skill and not of the material which he employed; not the paints but the brains with which the paints were mixed, in the words of OPIE'S famous reply as to how he got his wonderful effects. Of course, at one time rare herbs commanded a high price in therapy. A generation or two back a hospital physician might be prescribing for a single pneumonic patient a grain of musk at the equivalent of a week's drug bill for the whole ward; but substitutes for these costly products have been found without disadvantage to the patient. Salvarsan is costly, but its cost is hardly deterrent; the modern organic remedies such as insulin, although a tax on the resources when a long course is necessary, tend to cheapen as a result of mass manufacture; and the possibility of chemical synthesis always looms in sight. Serums and vaccines are not out of the reach of the panel patient who has over and over again been shown not to be at any disadvantage from the low average cost of the drugs and appliances supplied. But in the case of radium, values have completely changed and the stuff is far more costly than the specialist; so serious is the risk of its loss that radium element cannot be removed from the centres where it is used. It is, in fact, far and away the costliest marketable commodity. In times of civil strife and currency depreciation jewellers have been known to carry about their whole capital consisting of a few gems in a vest pocket, but the price of radium is above rubies. The total amount of the element ever extracted may not exceed 20 ounces, at a present money value of £6,000,000, and could (though should not) be carried in the coat pocket. There is a Radium Bank in Paris, and it would be open to a new nation to base its currency on a radium standard with the whole of its reserve in a small lead-lined safe. If, as seems probable, radium is to become one of the essential commodities of medicine, a difficulty to be faced is the fact that the cost of its production is quite unknown, for so far it has only been produced as a by-product by commercial companies engaged in some other form of mining. Until 1923 the carnotite deposits of Colorado were the chief source of supply, but the production there almost ceased after the discovery and exploitation of uranium ore found in the copper mines of Haut Katanga in the Belgian Congo. Since then the annual output of 30 to 40 grammes of radium element has been derived almost entirely from this source. Radium-containing minerals are widely scattered over the world, but the element cannot as yet be extracted from them at a commercial profit. Our own Cornish mines contain low-grade ores for which the Radium Committee does not see any great future. The manganiferous iron industry in South Australia and the felspar works in Ontario offer better possibilities, while promising deposits of pitchblende have been found in the Transvaal, in British India, and in the Tanganyika Territory. No radio-active minerals are at present known to occur in Northern Rhodesia, but that may well be because the geological survey has not been sufficiently pushed to discover them, for Rhodesia adjoins the frontier of the Belgian Congo in which pitchblende ore occurs containing over 50 per cent. of uranium oxide.

It may be wondered, and indeed the question has been asked by thoughtful persons, why such importance should be attached to the emanation from radium element when the most scrupulous care is taken to screen off its peculiar rays which consist of atomic particles or electrons, leaving only the gamma radiation which so closely resembles well-screened hard X rays, that little if any difference has been detected between the action of the one and the other. Why pay millions for extracting a few grammes of radium from tons of foreign ore when their effect can be closely simulated by electric means when the high-tension apparatus has been brought to the necessary pitch of perfection? The reply is a simple one, and fortunately quite conclusive; otherwise no one would feel happy to invest capital in the acquisition of radium element at its present price. The shorter the wave the greater the penetrating power. The gamma rays from radium have about a quarter the wave-length of the hardest rays yet produced, and the apparatus designed to produce these is not only very costly but undergoes rapid deterioration in use. To bring this artificial radiation up to the potency of the gamma radiation from radium would require apparatus which, if it were not beyond the wit of the electro-technician to make, would in the course of a few years cost at least as much in upkeep and replacement as the corresponding amount of radium element. For, incredible as it may appear to anyone except the hardened physicist, radium element can be employed for years without sensible loss. In 20 years the deterioration is only 0·7 per cent.; radium is, in fact, an engine running continuously without working costs.

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THE PROBLEM OF MENTAL DEFECT.

THE report of the Special Committee of the Board of Education and the Board of Control is a document that will repay careful study. Wide variations in the estimate of the number of defectives in the country made it essential for trustworthy investigation to precede the discussion of the main problem before the Committee—namely, the best method of educating the educable and training the remainder. Dr. E. O. LEWIS and his assistants carried out a careful survey of six selected areas, and there is no reason to doubt that their findings are applicable to the country as a whole. His report forms Part IV. of the volume just published,[1] while Part I. discusses the origin and scope of the Committee's work, mental defect and legislation concerning it, and Part II. the mentally defective child. Part III., dealing with the defective adult, is not yet available to the public. The conference of the Central Association for Mental Welfare, held last week, and briefly reported elsewhere in our columns, devoted two sessions to the published part, and expressed a strong feeling that the remainder ought to be published immediately in order that the problem may be dealt with as a whole. The most startling feature of the report is Dr. LEWIS's estimate of the number of defectives in England and Wales. He spent two and a half years collecting data in the chosen areas and a year in analysing his results. The magnitude and delicacy of his task are better imagined than described, and the account of it occupies 163 pages. The mean figure for the six areas was 8·57 mentally defective persons per 1000 population; about half of these would be adults. His standards were those agreed upon by the Committee after very careful consideration. They were uniform throughout the investigation and corresponded very closely with those of the Royal Commission of 1906; they are, however, more clearly set out in this report than in any previous investigation. The gross figure for the country is 340,000 persons, of all grades and ages, mentally defective within the meaning of the Mental Deficiency Acts. This is an enormous number, nearly twice as great as that given by the Royal Commission and some 280,000 more than the number of ascertained cases given in the last Board of Control Report. Improved ascertainment does not wholly account for this excess, and the inevitable conclusion is that the amount of mental defect in the country has increased quite definitely during the last two decades.

An important feature of the investigation is the recognition that mental defect must have a social rather than an educational criterion; it is not the inability to attain certain educational standards that constitutes defect, but the inability to use what has been learned in such a way that the individual adapts to the environment in which he finds himself. As Dr. T. BEATON emphasised at the conference, the problem is primarily one of behaviour, and so long as the individual behaves in a manner which does not draw attention to him he is not properly to be classed as defective, whatever his accomplishments in the three R's. A second point of vital importance is the reiteration by the Committee of the fact that there are no sharp cleavages in Nature. A leading educationist declared at the conference that more harm had been done to the progress of mental welfare by the idea that there was a difference in kind, rather than in degree only, than by any other factor. The recommendations for children contain a survey of the very large group of "dull and backward" and put into their proper place at the tail-end of these the certifiably defective. All these children, except those whose mental state is so low that immediate care and control is essential, are to be grouped under the local education authorities for the type of education adapted to their individual degrees of retardation. As a corollary to this, the Committee recommends that the certificate of mental defect, which is at present an essential preliminary to any education other than the routine of the elementary school, shall be abolished. The "special" school would then become part of the ordinary elementary school, and would consist merely of certain special classes with appropriate modifications of curriculum and organisation and a greater degree of individual teaching. The Hadow Report—which should be read along with this one—recommended a break in the general trend of education at the age of 11, and the Committee thinks it would be advantageous if at this age there were a general mental survey of all children with subsequent drafting to the necessary classes, the more retarded being provided with more handicraft training and less theoretical work. The suggested organisation is set out in detail, and it is interesting to compare the Committee's proposals with the experiment described to the conference by Mr. C. J. R. TIPPER. The Westmorland experiment shows what a high degree of success can be obtained in scattered rural areas by willing teachers and wise organisation. In large towns it is not difficult to transfer from schools to occupation centres the gravely retarded children who are detrimental to their fellows and largely ineducable; these are to be notified to the mental deficiency authority and removed from the education authority's purview.

The Committee realises that much remains to be done, for their investigation has inevitably drawn their attention to all those other children for whom the routine education fails to do its best—the shy, the emotional, and the physically handicapped. The report ends with a series of questions and a plea for further research. What has been done, however, is emphatically along the right lines. A great advance is being made towards better housing and better conditions of life and health, but side by side with slum clearance it is possible to watch slums being created afresh under conditions where they need not be. Dr. LEWIS's work suggests that there is a definite relation between the slum problem and the mental defect problem, and that mental deficiency, much physical inefficiency, chronic pauperism, and recidivism are all "parts of a single focal problem." If this be so it is essential that an energetic attack on the problem of mental defect should go hand in hand with other measures for social betterment.

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[1] Report of the Mental Deficiency Committee, 1929. H.M. Stationery Office. Pp. 428. 5s.

THE ZOO.

THE centenary of the Zoological Society of London was celebrated this week in a fine manner. The scientific value of a zoological collection properly collated and cared for was brought out; the source of instruction and amusement that such a collection is was testified to; and the almost religious feeling evoked by the attempt to preserve species which, unless artificially protected, must perish in the evolution of civilisation found wide expression. All these aspects of the part played in our lives by the Zoological Society were brought out by representative speakers at the two gatherings organised by the Society to mark the celebration. On the afternoon of Monday a formal meeting was held in the great Hall of Universtiy College, London, presided over by the Duke of Bedford, the President of the Society, when delegates from France, Germany, Holland, the United States of America, Scotland, and Ireland were present, as well as many international figures in the zoological world. Here the audience listened first to a witty sketch of the history of the Society given by the President. The foundation of the Society was definitely attributed by the Duke of Bedford to the joint efforts of Sir Stamford Raffles and Sir Humphry Davy, but as early as 1824, three years before the Society obtained its charter, a body of subscribers, of whom the Duke's great-grandfather was one, had obtained an appropriation of ground in Regent's Park, thus becoming the nucleus of the movement later to develop. The Royal patronage, which was definitely accented at a private dinner given by the Society on the evening of the same day by the presence of the Prince of Wales, was manifest from the first in the constitution of the Society, for the personal interest of King William IV. was obtained by the original founders. And this patronage was itself a continuation of a royal tradition, for Henry. I made a collection of wild animals received as gifts from foreign kings, while Henry III. founded a royal menagerie at the Tower of London which existed, though in modified form, at any rate until the days of John Hunter, for that prince of comparative anatomy obtained the right to make post-mortem examinations of animals who died while under the care of the Tower authorities.

The story of the Zoological Society told by the President was followed by an address from Dr. Chalmers Mitchell, the Secretary of the Society, who dealt with the work done in Regent's Park, in words which brought out clearly the developments that had recently taken place both in scientific endeavour and material amenities. We thus learned that not only does the Society celebrate its centenary by recording the possession of the largest number of Fellows in its history, as well as the largest number of visitors to the gardens, but, said Dr. Mitchell, the congratulations received by letter and by delegation from learned bodies all over the world prove that the Society has definitely taken its place in the scientific world by affording the means to foster a vast body of original research. And it is an exact commentary upon this statement to find that practically all the great zoological writers of the last century have made appearance as contributors to the Scientific Transactions published by the Society. It is as a focus for the study of comparative anatomy that the activities of the Zoological Society appeal primarily to the medical profession, and few realise how wide as well as how minute, how exact as well as how suggestive, is the knowledge which has been acquired by medicine from the investigations of the zoologist. In mediæval days, when the dissection of the lower animals was substituted necessarily for that of the human body, the functions of the human organs were often sadly misunderstood from the attempts to draw analogies, with the illogical result that it was the study of comparative anatomy which suffered through prejudice. The credit of elevating that study to its proper position may be attributed to the grant by Charles II. of a charter to the Royal Society, and in great measure to the individual work of Samuel Collins, physician in ordinary to the King. The part later played in the story of medicine by the development of comparative researches, especially in France and England, can be traced in all the literature dealing with the morphology of the human subject and of the lower animals, and regarded only as a laboratory for such inquiries the hundred years of work in the Zoological Gardens must command our gratitude and admiration.

But there is a nobler and wider appeal made by the Zoo than that founded on its services to science. When detailed scientific study can be brought into direct relation with the general emotions, such emotions are quickened and enlarged in range through the possession of an accurate foundation; and those who may be called the unscientific look at the world of natural history with vastly greater pleasure after great object lessons. But this pleasure is shared by the workers in zoology and all who can follow the relations of their activities to medicine. The exponents of exact zoology themselves obtain an intense pleasure from their labours through the knowledge that their investigation of facts is affording an outlook upon nature that could have been obtained in no other way. At the private dinner in Regent's Park the much-travelled Prince of Wales testified to the fascination to be derived from seeing in their native state a large number of the denizens of the Zoo—he pleaded for the use of this convenient abbreviation; and the Belgian Ambassador followed suit in eloquent as well as amusing vein. They were expressing the feelings of countless visitors to Regent's Park, who derive from this grand collection a survey of the wonders of creation, learn much of the doctrines of evolution, and appreciate to the full the intelligent kindness with which the inmates are treated. That the Zoo may continue to prosper is the wish of all, and that it can do other than prosper is unthinkable.

British Hospitals' Association.—The usual separate conferences of the British Hospitals' Association and the Incorporated Association of Hospital Officers were last week replaced by a joint conference held at the University of London, South Kensington, under the presidency of Sir Arthur Stanley. Mr. J. H. Whitley, late Speaker of the House of Commons, opened a discussion upon the Relations between Voluntary Hospitals and Municipal Hospitals under the Local Government Act, and suggested that the conference should nominate representatives of the voluntary hospitals in the various areas who would work side by side with the county and county borough councils. Mr. H. L. Eason uttered a warning against the danger of coöpting upon the new committees persons who have had local government experience to the exclusion of those who hav had experience in the administrative or professional work of the voluntary hospitals. At the annual dinner Mr. Whitley pointed out the advantages that must result from the existence of a hospital council which would enable even the smallest cottage hospital to feel that it was part of a very great and important work. It was stated that hospitals containing 24,000 beds, 11,000 of them outside London, are now subscribers to the federated superannuation scheme.

Annotations.

"Ne quid nimis."

LIFE-TABLES.

IN the fifth annual report of the Registrar-General, published 83 years ago, there is a remarkable panegyric on life-tables. The report is, indeed, *signed* "George Graham," but a belief that—"By these comparisons (i.e., of National Life-Tables) a noble national emulation might be excited: and rival nations would read of sickness diminished, deformity banished, life saved—of victories over death and the grave—with as much enthusiasm as of victories over each other's armies in the field;" argues a robuster faith in the saving virtues of vital statistics than anybody but William Farr has ever possessed. Farr, indeed, was the pioneer in using the life-table as a biometer, holding it to be as "indispensable in sanitary inquiries as the barometer or thermometer and other instruments in physical research." No doubt there was exaggeration in this, but the experience of three generations has proved that, for some important purposes, the life-table is a statistical instrument of medical value. A practical difficulty was that, to the ordinary medical man, the methods of construction, even those of Farr, who knew how little algebra most medical men knew, were more than a trifle perplexing. To Sir Arthur Newsholme belongs the credit of having pointed out to medical men that the (to them) most perplexing stage of the process of construction could be carried out without any resort to algebra. Newsholme and Stevenson proved that a graphical method was quite satisfactory, but there is reason to suppose that students still believe that graduation by formula is, in some mysterious way, more scientific than graduation by the graphic method. On that account we are glad to publish a further illustration, from the pen of Miss H. M. Woods, of the London School of Hygiene and Tropical Medicine, of the simplicity and success of the process. It is true that the use of this method does not dispense the worker from some hours of arithmetical calculation; but the virtue of it is that a medical man, after a very little practice, can confidently perform all the operations intelligently and easily without having to carry in his head, or in a notebook, formulæ the derivation of which he does not understand. There are enough inherent difficulties in statistical work for it to be very desirable that unessential obstacles should be removed. We hope that by recalling the attention of readers to Sir Arthur Newsholme's work, Miss Woods may induce others besides professed students of public health to use Farr's beloved instrument.

DANGEROUS DRUGS ACTS REQUIREMENTS.

THE Home Office has issued a third edition of its memorandum on the duties of doctors and dentists in respect of the Dangerous Drugs Acts and the Regulations made thereunder. It is probably common knowledge by this time that any duly qualified medical practitioner and any registered dentist is authorised "so far as is necessary for the practice of his profession" to be in possession of dangerous drugs and to supply them to his patients by personal administration or by administration under his direct personal supervision and in his presence. The doctor —but not the dentist—may also dispense dangerous drugs for his patient's use and may be in possession of the raw materials for use in the compounding of medicines though he may not supply the raw materials to a patient. Probably the two most important aspects of the law are those which concern prescriptions and the keeping of records. There are some 17 specified drugs which, though they come within the Dangerous Drugs Acts, are specially exempted by the regulations and are purchaseable in Great Britain in the same way as ordinary "poisons" under the Pharmacy Acts. Apart from these specified drugs (which are listed in the Third Schedule of the Consolidated Regulations issued last December) any other dangerous drug (if prescribed in sufficient strength to bring it within the Dangerous Drugs Acts) involves the following duties on the part of the prescriber. The prescribing doctor or dentist must write his prescription, date it, sign it with his usual signature and—except in the case of health insurance prescriptions issued on the official form—must add his address; he must also give the patient's name and address and must specify the total amount of morphine, cocaine, or other drug to be supplied. The only exception to this last requirement is that, where a preparation is prescribed which is contained in the British Pharmacopœia, the British Pharmaceutical Codex, or the Minister of Health's health insurance drug tariff, only the total amount of that preparation need be specified. The Home Office, perhaps not unreasonably, explains that chemists are not allowed to dispense a prescription which does not comply with the foregoing requirements, and the memorandum hints that irregularities do occur, and that doctors must not take offence if chemists ask them to correct an irregularity. A chemist cannot dispense a prescription containing a dangerous drug unless (*a*) he knows the prescriber's signature and has no doubt of the genuineness of the prescription, or (*b*) he has taken reasonably sufficient steps to satisfy himself that the prescription is genuine. As the Home Office points out, this situation can be uncomfortable for the chemist, who may find himself obliged either to delay the prescription (with the prospect of offending the prescribing practitioner) or to break the law. As to the requirement of record-keeping, the memorandum draws attention to the obligation upon a medical practitioner to keep a record of all supplies of dangerous drugs to patients except only in cases where the drug is administered by the practitioner himself or under his direct supervision and in his presence. The memorandum also reprints in an appendix paragraphs 50 to 60 of the report of the Departmental Committee (presided over by Sir Humphry Rolleston) on Morphine and Heroin Addiction. The passages are those which deal with the precautions necessary in administering these two drugs on the one hand in treating addicts and on the other hand in ordinary medical practice; but, indeed, the whole of the Departmental Committee's report (published in 1926 by H.M. Stationery Office at the price of 1s.) is worth study.

The special occasion of re-issuing the Home Office memorandum is the embodiment therein of certain changes in the law due to the operation of the Geneva Convention of 1925—changes which the Dangerous Drugs Act of 1925 was designed to implement. One result is an alteration of the list of drugs within the Dangerous Drugs Acts. The Geneva Convention amplifies the International Opium Convention signed at The Hague in 1912. Among other provisions it creates machinery (through the agency of the League of Nations) for varying the list of narcotics in Chapter III. of the Convention, a list which corresponds with that of the drugs to which Part III. of our Dangerous Drugs Act of 1920 applies. The new machinery will enable the exclusion of any narcotic which is found not to give rise to the drug habit. Part III. of our 1920 Act named morphine, cocaine, ecgonine, diamorphine (or heroin) and their respective salts, and also medicinal opium. Our 1925 Act has a fresh definition of ecgonine and medicinal opium; it explains that cocaine includes synthetic cocaine; and it adds to the list of narcotics in Part III. "any extract or tincture of Indian hemp." Subsequent regulations, however, show that medicinal preparations containing extract or tincture of Indian hemp as one of their ingredients do not come within the Dangerous Drugs Regulations. It remains to add that an Order in Council last August applied Part III. of our 1920 Act to benzoyl-morphine, dihydro-oxycodeinone, dihydrocodeinone, and their respective salts. Subsequent regulations issued last

November enact that no one may have any dealings of any kind in benzoyl-morphine and its salts or preparations without the Home Secretary's licence; the general authorisation which doctors and dentists enjoy in respect of the other dangerous drugs does not apply here. Unquestionably the law as to the use and supply of dangerous drugs is complicated and increases the cares of the busy practitioner. At the same time it must be admitted that the Home Office reasonably met the interests of the medical profession in the matter of the Reference Tribunal and the machinery for withdrawing a practitioner's authority under the Acts; and the recent re-issue of the memorandum is to be commended as an aid to the comprehension of the profession's responsibilities.

EPIDEMIC ENCEPHALITIS AND WAR SERVICE.

IN this country from time to time considerable difficulty has been experienced in deciding how far an ex-Service man's disability, when it takes the form of chronic disease, can be held attributable to his war service. The administrator adjudicating on the question of war pension is naturally guided largely, if not entirely, by medical advice. The medical expert has to consider on the one side that a too ready alacrity to accept all post-war manifestations as due to war service is not only scientifically incorrect, but is making unfair demands on public funds, even although the individual case may excite justifiable compassion; on the other hand, he must remember that too rigid definitions of war diseases may be unjust to the victims of the chronic maladies which had their ætiology during the period of the war and were fostered by military conditions.

That difficulties of this nature have equally arisen in Germany is shown by a paper[1] in which Romberg and Bremer deal with the problem of epidemic encephalitis as a disease attributable to war. At the outset they found that the possible association of epidemic encephalitis and influenza demanded consideration, and were led to the same conclusion as F. Stern—namely, that the time-relations of the two diseases indicate an epidemiological association. In 1918, they point out, influenza was almost universally epidemic on the German front, whole battalions having to be invalided home, and epidemic influenza was both preceded and followed by epidemic encephalitis. They have formed the opinion that true influenza contracted on military service has been followed by epidemic encephalitis, although such a contention is admittedly difficult to prove and no valid statistical evidence is procurable in its favour. They urge that the connexion if not direct may be indirect and the influenza virus which is unknown may activate or endow with pathogenic properties the equally unknown virus of epidemic encephalitis. In 1925, at the request of the German National Welfare Board, Romberg gave a ruling on the war attributability of cases of epidemic encephalitis. Premising that the question is a complex one, he stated:—

> (1) The connexion of epidemic encephalitis with war service must be assumed in all cases where epidemic encephalitis occurred in the field and even in cases where this event is only a probability.
>
> (2) The same connexion must be assumed if an attack of influenza occurred in the field and after the war was immediately followed by the so-called pre-neurasthenic state which merged into the clinical picture of chronic encephalitis.
>
> (3) A similar connexion is assumed if epidemic encephalitis did not immediately follow on the attack of "influenza" in the field, but developed after a certain interval of time during which the individual had been apparently free from disease.

Romberg considers this interval of time should not exceed six months. His third ruling has been the subject of most criticism, but in defence it is argued that it is only applicable to a few special cases. The possible influence of war-strain and war conditions on the ætiology of epidemic encephalitis is not discussed in Romberg and Bremer's paper. It must be observed that the evidence they adduce for the association of influenza and epidemic encephalitis is not very substantial, as they themselves acknowledge, whilst their experience of the occurrence of true "encephalitic" cases in the influenza epidemics of 1890–91 is at variance with the British experience. Again, in the outbreak of epidemic encephalitis in this country in April to June, 1918, when the first wave of the influenza epidemic had appeared, the cases were almost, if not entirely, sporadic and no connexion with cases of influenza was established. A. S. MacNalty considers that the prodromal stage of epidemic encephalitis is often mistaken for influenza, whilst A. J. Hall has pointed out in his Lumleian lectures that if there is any connexion between epidemic encephalitis and influenza it is unusually well concealed from the clinician. The occurrence of an encephalitis due to influenza, although rare, must not be forgotten.

It is probable that by using the term "influenza" Romberg and Bremer have made the attributability of epidemic encephalitis to war conditions more extensive than many neurologists would allow. The difficulties of the position have to be recognised, and it must be agreed that if any error has been made it has been on the side of generosity to the ex-Service man.

THE MACKENZIE MACKINNON RESEARCH FUND.

THE late Sir George Sutherland Mackenzie directed in his will that £30,000 should be paid to the Royal College of Physicians of London and the Royal College of Surgeons of England to form a fund for the promotion of scientific medical investigation. The immediate object of the bequest was to assist students of high intellectual promise by rendering them independent of ordinary professional income whilst carrying out research. The fund he desired "to be named after and in grateful remembrance of my best friend, the late Sir William Mackinnon, Baronet of Balinakill and Loup, to whose unvarying kindness and influence upon me in my youth is due the means and inclination that prompts me to provide this endowment." It was further his hope that others might from time to time add to the fund "feeling like myself that should the conditions be fulfilled the steady coöperation of trained workers may ensure the settlement of questions admitting of doubt and thus prepare the way for the great discoverer who may be destined to throw the light of genius upon problems which their predecessors failed to solve." The annual income from the bequest is at present £1278 and a joint committee of the two Colleges has recommended that it shall be used for the foundation of Mackenzie Mackinnon Fellowships, of which not more than two will be granted annually. Candidates must be nominated for election by a medical school; they will be eligible for re-election, but their tenure of Fellowships will not extend for more than three years except by special resolution of the Colleges.

SPINAL ANALGESIA IN OBSTETRICS.

SPINAL injection is but little employed in this country for the facilitation of labour. It would probably not be incorrect to say that its use in obstetrics is restricted to cases of Cæsarean section where there is definite reason to prefer spinal to any general anæsthetic. Dr. Max Cheval, of Brussels, who has had a wide experience of spinal injection both in gynæcology and in obstetrics, considers[1] that for the latter branch of work it is only exceptionally the method of choice. He does not find that spinal injection facilitates the dilatation of the cervix although he does consider that it abolishes uterine contraction. The indications for the use of spinal injection in obstetrics he holds to be conditions of the patient which forbid general anæsthetics, for example, pulmonary tuberculosis and heart disease, and tetanically contracted uterus threatening rupture. The author gives details of a case refuting the contention of Delmas that with spinal injection dilatation of the cervix is always an easy matter. Other writers [2] on the same ground are more enthusiastic supporters of Delmas, maintaining that the cervix is always well relaxed under spinal analgesia if it is normal to start with. A failure in dilatation of the cervix is due in their view to fibrosis or other pathological change prior to the labour. They also lay stress on the complete relaxation of all the external genital canal and perineum as an additional advantage gained by the spinal injection. On the other hand, they describe difficulty in the method advocated due to hypertonus of the uterine muscle which may render version well-nigh impossible.

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[1] Romberg, E. von, and Bremer, F.W.: Encephalitis epidemica und Kriegsdienstbeschädigung, Münch. med. Woch., April 5th, p. 570.

[1] Bruxelles Médical, March 31st, p. 619.

SEROTHERAPY IN INTESTINAL OBSTRUCTION AND IN APPENDICITIS.

ONE of the few legacies of the late war which are likely to prove of permanent benefit to humanity has been the elucidation of many problems in anaerobic bacteriology. The work of Weinberg in France has been of great value, and in this country Muriel Robertson and W. E. Gye have made contributions of importance. The fact that *Bacillus welchii*, one of the causal organisms of gas-gangrene, is a normal inhabitant of the intestinal tract leads logically to a search for possible pathogenic effects in its normal habitat. Pernicious anæmia has been related to it with some plausibility, whilst its relation to septic conditions has been investigated in this country by B. W. Williams and in France by Weinberg and his colleagues. A recent publication [3] by the latter summarises his elaborate work on the nature of the infection in acute appendicitis. His technique deserves attentive notice; he has slit open the affected organ, removed fæces, and then made cultures of the inflamed mucosa. In this way he has hoped to get rid of all save the pathogenic organisms, but analysis of the findings suggests that in this respect he is unduly optimistic. Of 160 cases there are no fewer than 23 in which four different organisms, and 16 in which five organisms, are inculpated. Such a multiple infection is certainly not impossible, but it is highly improbable if we may draw deduction from acute infections elsewhere; moreover, the commonest organism is *B. coli*, the normal saprophyte of the fæces. Of anaerobic forms 14 different types of organisms have been found, and apparently their presence is taken as proof of pathogenicity; it often seems to come as a surprise to bacteriologists that the fæces are seldom sterile. Having determined to his satisfaction the nature of the infection Weinberg has proceeded to serotherapy. His view of the multiplicity of the infection has led to the use of a polyvalent antitoxic serum. In particular he includes an anti-*coli* serum, and his work (which is entirely novel) on the production of both toxin and antitoxin to *B. coli* will be awaited with interest. He also includes among other sera the antitoxins of anaerobic forms. The use of these and analogous sera is perhaps more widespread than he realises. He specifically states that no work has been done in this country on the subject, whereas in fact the papers of Williams [4] have attracted a great deal of attention. But Williams's conception is fundamentally different. He argues that in acute obstruction and in the stasis incident on acute appendicitis, there is a proliferation of *B. welchii* in the small intestine, and absorption of toxin without infection. Therefore he treats such cases with anti-*welchii* serum and claims excellent results, largely substantiated by others.

The nature of the toxæmia of obstruction and stasis has long been a mystery. It seems reasonable to suppose that infection is due to one cause and toxæmia to another. The vastly larger number of *B. welchii* in the small intestine (and in almost pure culture) than in the appendix certainly supports Williams's view. Perhaps too much stress may be laid on these distinctions; perhaps, if the view of Weinberg is too extensive, that of Williams is too narrow. At least serum therapy in appendicitis is firmly established, and further work on both sides of the channel may soon determine the best proportion between available sera.

A SET-BACK IN MID-LIFE MORTALITY.

UNDER this heading the Metropolitan Life Insurance Company surveys in a recent bulletin [1] the course of mortality since the issue of the last official American life-table for 1919–20. The previous table (1910) compared with that for 1901 had shown an actual increase in mortality at the higher ages of life, but the misgivings engendered by this finding were to some extent allayed by the experience of the succeeding decade when improvement at nearly every age was in evidence. The outstanding features of the experience of the current decade in the United States of America are a decline in mortality at ages under 37 years and a definite tendency for adult mortality to increase. Most instructive in this connexion is the comparison of the extreme years of the series—1927 and 1921. The expectation of life at birth (mean after-life time) for these two years was 59·10 and 58·01 respectively, a gain of just over one year. At the end of the first year of life, however, the expectations were almost equal—namely, 61·48 and 61·49 respectively. The improvement within the period 1921–27 has thus been secured chiefly by the decline in mortality of infants; higher ages show an actual loss. Similar facts emerge when instantaneous death-rates are subject to comparison. From age 37 till the end of the life-span, mortality in 1927 exceeded that of 1921. The promise given by the experience of the previous decade has therefore not been fulfilled. Possibly in 1921 conditions, so far as concerned adult mortality, were unduly favourable, and the result of such a comparison in consequence too pessimistic. Subsequent to the pandemic of influenza, which played havoc particularly with persons in impaired health, a great decline in mortality at older ages took place, and the deterioration observed at these ages between 1921 and 1927 may simply represent a return from abnormally favourable to normal conditions. Such an explanation, even if true, does not make the figures much less discouraging. The state of affairs is not very dissimilar in this country where the improved expectation of life at birth is in the main due to a declining infant mortality. Some diminution of the deaths at adult ages is surely within the scope of preventive medicine, and there is no reason to believe that mid-life mortality has been reduced to its lowest possible level.

THE UTILISATION OF MILK RESIDUES.

THE Scottish National Milk and Health Association and the Empire Marketing Board have done a useful piece of work by carrying out an investigation of the utilisation of surplus milk and milk residues in Scotland. The investigator appointed was Mr. Archibald MacHeilage, jun., and the result is to hand in the informative Bulletin I. of the Hannah Dairy Research Institute. Prof. E. P. Cathcart, the Interim President of the Institute, in a preface lays emphasis on the fact that the full utilisation of the milk produced is a matter of national importance and that all milk residues, whether skimmed milk, buttermilk, or whey, have a high biological value. The report shows that milk residues produced on the farms are utilised locally by feeding to stock and by sale to bakers and the local population. That this method of disposal is not altogether satisfactory is indicated by the experience of the south-western counties which turn out most of the cheese. There are enough pigs to absorb all the whey but a considerable proportion of the whey is not employed economically.

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[2] Ibid., April 14th, p. 679.

[3] Ann. de l'Inst. Pasteur, 1928, xlii., 1167.

[4] Brit. Jour. Surg., 1926, xiv., 295; THE LANCET, 1927, i., 907.

[1] Statistical Bulletin, 1929, vol. x., No. 2.

In round figures 114 million gallons of milk are sold off the farms annually, of which 82 are retailed and 32 go to factories or depôts. Of the 32 millions which pass through the depôts, 18½ are retailed, while 7 millions and more than 6, respectively, are used for making cream and cheese. Of the residual separated milk and whey from these two latter processes, it is estimated that 1¾ million gallons of separated milk and 4¼ million gallons of whey are run to waste. It is further pointed out that the amount of skimmed milk run to waste is approximately equal to the amount of condensed separated milk imported into Scotland. In the U.S.A. and Canada the farmers in the cheese-making districts remove their proportion of whey from the depôts and it is reckoned to be worth 1¼*d.* per gallon as a stockfeed. In Scotland this method is not favoured, owing to the risk of the contamination of milk cans and the deterioration of tinware, but some of the depôts have their own piggeries. In Ontario the cheese factories recover the fat from the whey and in Canada in 1925 the production of whey butter amounted to 1,402,573 lb.

The most striking thing in the report is the evidence of neglect of separated milk as a human food. The factories which supply cream do so at a price to cover the cost and profit on the milk from which it is produced so that any return they get by the sale of the separated milk is "found money." The dealers, on the other hand, say the public does not understand the value of separated milk and for their part do not push its sale for fear of bringing about a drop in their sales of whole milk. The average price paid by the Scottish bakers for separated milk is 5*d.* a gallon carriage paid.

SOCIETY FOR RELIEF OF WIDOWS AND ORPHANS OF MEDICAL MEN.

THE annual general meeting of this Society will be held on May 8th, when the Report for 1928 will be presented. The directorate of the Society has suffered severe losses during the year. Its President, Dr. F. de Havilland Hall, died during his term of office, as well as three Vice-Presidents—Sir William Church, Dr. Blackhall Morrison, and Dr. Walter Rigden—each of whom took the keenest interest in its work. The Society at present consists of one honorary, 163 life, and 137 ordinary members—a total membership of 301. The smallness of the membership has been a matter of concern to the Directors and during the year a letter was sent to the deans of medical schools, asking them to draw the attention of newly qualified men to the advantages of joining. The advantages offered are substantial, for the Society is both provident and benevolent. Should a member die and leave his widow with an income not above £125 per annum, she would, on the present scale, receive from the Society a yearly grant of between £75 and £90, and any children under the age of 16 would receive a yearly grant of £60 each. Over the age of 16 special grants may be made to orphans to enable them to continue their education or start in some profession. These grants in many cases amount to £52 10*s.* a year to each orphan. Medical men whose dependents would never be in need of assistance from the funds would be helping the widows and orphans of their less fortunate brethren by becoming annual subscribers or by giving a yearly donation. The amount of the annual subscription is small compared with the benefits that may be derived by unprovided dependents of a deceased member. The annual subscription for a member who at the time of his election is under forty years of age is two guineas; if over forty but under fifty, three guineas; and if over fifty, four guineas. There are special terms for life membership. Membership is open to any registered medical practitioner who at the time of his election is resident within a twenty-mile radius of Charing Cross. Relief is granted to the necessitous widows and orphans of deceased members of three years' standing, and of life members. The invested funds now amount to £140,500, which produced last year an income of £4174 16*s.* Two widows died during the year. One, whose husband had paid in subscriptions £26 5*s.*, received in grants from the Society £2040, the other, whose husband had paid £31 10*s.*, received in grants £990. *The first widow was in receipt of grants for* over thirty years. The sum of £4772 10*s.* was distributed in grants among 50 widows and seven orphans. Application forms for membership may be obtained from the Secretary of the Society, at 11, Chandos-street, London, W.1.

STERILISATION OF THE UNFIT.

DISCUSSION on certain kinds of reform is apt to degenerate into periodic expression of opinion Every now and then promoters and opposers argue hotly, and the unconvinced majority wonder vaguely which of the two groups is right, but in the absence of proof the public interest dies away again for the time being. This to-and-fro method may play an important part in undermining prejudice and insinuating the thin edge of an innovation, but it is unsatisfactory to people who sincerely want to learn what they can about the subject. Lord Riddell's plea for the sterilisation of the unfit, based mainly on the ground of public economy, lacked nothing in eloquence and persuasiveness, but most of the discussion at the Medico-Legal Society last Thursday (reported on page 921) could have been paralleled from previous discussions, and the observer was *left with little more than the conviction that* many authorities believe that sterilisation would be a good thing, while others—backed by the Board of Control and the Central Association for Mental Welfare—believe that it would be either undesirable or impracticable or both. Had John Hunter been among the audience he might well have burst in with his impetuous "Don't think; *try.*" To "try" sterilisation is no simple matter, but since the last general discussion on it was held the results of a big experiment have been carefully assessed by special investigators, and their work merits the considered judgment of all who are concerned to form an unbiased opinion on the results of sterilisation.

There is no commoner and at the same time no more ill-informed argument against sterilisation than the statement: "Oh, it's been tried in America and given up as a failure." The fact is that 22 States have passed sterilisation laws since 1907, and in only one of them has it been repealed. In a few *it has hardly been enforced at all, but in many it is* being put into operation more and more. California stands out because the law has always been applied there energetically, so that during the last 20 years 6255 eugenic sterilising operations have been performed. This number is large enough to form valuable material for investigation, and an impartial inquiry into every possible aspect of the work has recently been financed by a Pasadena philanthropist, Mr. E. S. Gosney. We have already noticed one paper of the series: that in which Dr. R. L. Dickinson concluded that the operative risk involved was almost negligible.[1] As Lord Riddell pointed out, the total death roll in California has been three, while even in the apparently risky salpingectomy, wound infection only occurred in 2·2 per cent. An objection often stressed, and raised by Lord Atkin in a letter to the Medico-Legal Society, is the difficulty of selection and of deciding who shall select. For propaganda purposes it is essential that the promoters of sterilisation should clear their ground on this matter. A great deal of confusion has been caused in the States by the proposal that sterilisation should be used in a penal as well as in a eugenic sense.

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[1] See THE LANCET, March 2nd, p. 456.

It cannot be too strongly emphasised that—for the present at any rate—the proposal is simply and solely to sterilise the quite hopeless but fertile and well-behaved cases of mental defect. No physician of experience has the slightest difficulty in giving a prognosis for a feeble-minded youth or girl, and few doctors who have to do with these young people would quail before the responsibility of advising sterilisation for a large number. In California no inmate of the State home for the feeble-minded is allowed out unless sterile. Another objection is that the sterilised defective would be a source of immorality and venereal disease. The answer given is that sterilisation makes little difference one way or another to the habits of a defective. If selection is careful and supervision reasonably adequate, no defective of immoral habits will be returned to the community. That this is a feasible policy is shown by a careful follow-up of 605 patients from the California State home. Only one boy—an exhibitionist—showed any sexual delinquency and only 3·8 per cent. of the total were found incompatible, for other reasons, with free social life and the public welfare. Social workers and other trained observers are unanimous in denying any signs in this group of viciousness or tendency to spread disease. These tendencies are still further decreased by the possibility of marriage which—the tragedy of the fertile defective—is to be welcomed for the sterilised as it stabilises their life and increases their happiness. Inquiry showed that of 136 marriages among Californian sterilised defectives two-thirds were successful in that the couple were monogamous, law-abiding, self-supporting, and reasonably happy. Questionaires showed that social workers, parents and relatives, physicians, eugenists and patients were all alike satisfied with the experiment.[2] This fact in itself answers a good many of the honest fears of opponents of sterilisation, and these published results fall into a very different category from speculations of what might happen and unsupported rumours of what does happen "over in America." A cogent objection which the Californian experiment does not counter is that sterilisation can produce so little effect on the number of defectives born that it is not worth doing. It may reasonably be argued, even so, that if it increases the happiness of living defectives and decreases their expense to the nation it is still worth while. On the other hand, Mr. R. A. Fisher has claimed that it might well reduce the incidence of mental defect by 36 per cent. in one generation[3] and though the validity of such figures can only be judged by statisticians, the plain man cannot forget that the children of defectives ought never to be born. Sometimes cruel by nature, more often cruel from ignorance, generally without self-control, the feeble-minded parent is utterly unfit to nurse and train children of tender years. As Mrs. Pinsent has said, "The condition of the children of mental defectives is enough to make the most cynical ashamed of our civilisation." A recent investigation into the clientèle of birth control clinics[4] has shown that these do not touch the problem; the defective mother has not the foresight and sense of responsibility required to attempt prevention on her own initiative.

About the condition of the defective's home and the magnitude of the problem there are no two opinions. We have drawn attention again and again to the terrible disparity between the institutional accommodation available and the numbers needing it. At the latest estimate there are nearly 300,000 irremediable defectives at large, many of them propagating rapidly. Segregation must be slow and enormously expensive. The argument of the steriliser is: Since these people are not on the whole antisocial but their reproduction is a personal and national tragedy, let us submit them to a simple, safe operation which will do nothing to them save prevent conception. The liberty of the individual is infringed daily to protect the community from infectious disease, but mental defect is a graver thing than small-pox or yellow fever, for it threatens the future of the race. The Californian experiment has shown that sterilisation can be carried out on a large scale without any of the evil results feared by the cautious. To object to a measure because it does not solve the whole problem is surely the weakest of all arguments for doing nothing at all. Nobody claims that sterilisation will abolish the need for colonies, institutions, and supervision, but it will give freedom to those who are worthy of it, will reduce public expenditure, and will take its place as an essential element in a complete and well-organised programme of mental hygiene. These arguments deserve a more general and a more thoughtful consideration than they usually receive.

BRITISH CONGRESS OF OBSTETRICS AND GYNÆCOLOGY.

THE Seventh British Congress of Obstetrics and Gynæcology opened in Dublin on April 24th under the presidency of Dr. Gibbon FitzGibbon. The first day was devoted to a discussion on The Management of Cases of Pelvic Disproportion, when Prof. Munro Kerr opened with a paper on The Diagnosis of Pelvic Disproportion, by (*a*) instrumental, (*b*) manual, (*c*) radiographic methods. He pointed out that there is by all methods great difficulty in arriving at exact measurements of the pelvic inlet, but that deformities of the outlet could be exactly determined. The selection of treatment for deformity of the pelvis at the inlet therefore depended on an exact estimation of the relative size of the head to the pelvis; but for the outlet treatment should be based on exact measurement of the outlet. He emphasised the importance of recognising minor deformities, as failure to do so resulted so often in unsuitable treatment being employed. He believed that the largest proportion of disasters occurred in this group. In conclusion, he pointed out that the practical question was—will the head pass? He referred to the factors which influenced spontaneous delivery: (*a*) previous obstetric history; (*b*) any irregularity in pelvic brim; (*c*) size of fœtal head; (*d*) degree of ossification; (*e*) variety of biparietal obliquity; (*f*) strength of uterine contractions. A report of the proceedings will follow in our next issue.

Members of the Congress were entertained at luncheon at the Royal Hibernian Hotel on the opening day by the local council, and, in the evening the President and Mrs. FitzGibbon held a reception in the Royal College of Surgeons, which was largely attended. The Congress Dinner was held on April 25th at the College with the President in the Chair.

Sir George Blacker has been appointed President of the Radium Institute in succession to Sir Anthony Bowlby (deceased), and Sir Hugh Rigby's name has been added to the Committee of the Institute.

THE 161st exhibition of the Royal Academy of Arts is on the eve of being open to the public. Two of the outstanding portraits in the exhibition are of distinct medical interest, namely, that of Lord Moynihan by Mr. Richard Jack, and that of the Rt. Hon. Neville Chamberlain, the Minister of Health, by Sir William Orpen. Both are admirable presentations.

THE amount of the Central Practitioners' Fund for the year 1928 has been finally determined at £6,191,750, of which the London Insurance Committee's share is £882,079. The amount due to this Committee in final settlement is £30,752. The total payment for the year works out at 8*s*. 11·725*d*. per unit of credit; the corresponding figure for the year 1927 was 8*s*. 10·447*d*. This represents an average capitation fee in 1928 of 9*s*. 0·031*d*., as compared with 8*s*. 10·87*d*. in 1927.

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[2] Popenoe, Paul: Jour. Nerv. Ment. Dis., 1928, lxvii., 17; and Jour. Heredity, 1928, xix., 73, et al.

[3] Eugenics Review, 1924–25, xvi., 114.

[4] Hines, N.: Eugenics Review, 1928, xx., 157.

THE NATIONAL RADIUM FUND.

THE following letter appeared in the *Times* of April 20th :—

Sir,—It is now established that in the treatment of cancer radium is an essential instrument; month by month this becomes more manifest.

The medical profession in its attack upon cancer is seriously hampered by the grievous insufficiency of the supply of radium in this country. And it is well to remember that this disease is not confined to those who are worn by age or debility, but attacks vigorous men and women in the full plenitude of their usefulness.

This fact is illustrated by the statement that 4000 women, many of them mothers of families, die yearly in England and Wales from cancer of the womb.

The need for radium is great and urgent, and the supply is altogether inadequate to meet the need. There thus exists a grave situation. Human life is at stake—and with it the nation's reputation.

In these circumstances we ask to be allowed to appeal through your columns to the whole nation for the money wherewith to purchase radium on a scale adequate for this pressing purpose.

Radium is, however, very costly and a large sum of money will be needed. To secure an adequate supply for present and forthcoming needs there will be required £250,000.

His Majesty's Government has promised to make a grant of £1 for every £1 subscribed up to a limit of £100,000, so that our appeal to the generosity of the country is for £150,000.

The radium will be bought and held by a body of Trustees which has the confidence alike of His Majesty's Government and the medical profession. It will be administered by a Commission which will contain an effective majority of members representing the skilled and experienced workers on the staffs of the voluntary hospitals.

We suggest that contributions to the National Radium Fund will commemorate in a way peculiarly impressive the thankfulness felt for the King's convalescence after so dangerous an illness. This national appeal and that being made by King Edward's Hospital Fund for London are acting in close coöperation and have the advantage of the same treasurer and office organisation.

Contributions should be marked "Radium," and sent to Treasurer, Thank-Offering Fund, 103, Kingsway, London, W.C.2.

JOHN ROSE BRADFORD,
President, Royal College of Physicians; Member of General Council, King Edward's Hospital Fund.

MOYNIHAN,
President, Royal College of Surgeons.

FLORENCE E. BARRETT,
Consulting Gynæcological Surgeon, Royal Free Hospital.

E. FARQUHAR BUZZARD,
Regius Professor of Medicine, Oxford.

DAWSON of PENN,
President, Royal Society of Medicine.

ROBERT A. FLEMING,
President, Royal College of Physicians, Edinburgh.

GORELL,
Chairman, King's College Hospital.

THOMAS HORDER,
Member, Advisory Committee, British Empire Cancer Campaign.

KNUTSFORD,
Chairman of the London Hospital.

J. P. LOCKHART-MUMMERY,
Chairman, Executive British Empire Cancer Campaign.

EWEN J. MACLEAN,
President, British Medical Association; Senior Gynæcologist, Cardiff Infirmary.

J. M. H. MACLEOD,
President of the Section of Dermatology, Royal Society of Medicine.

ALEXANDER MILES,
President, Royal College of Surgeons, Edinburgh.

READING,
Chairman, British Empire Cancer Campaign.

HUMPHRY ROLLESTON,
Regius Professor of Medicine, Cambridge; Chairman of Imperial Cancer Research Fund.

ARTHUR STANLEY,
Treasurer, St. Thomas's Hospital: Chairman of the British Red Cross Society.

STANMORE,
Treasurer of St. Bartholomew's Hospital.

STCLAIR THOMSON,
Emeritus Professor of Laryngology, King's College Hospital.

JOHN BLAND-SUTTON,
Vice-Chairman, British Empire Cancer Campaign.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XXIX.—THE INTERPRETATION OF BASAL METABOLISM TESTS.

A CLEAR understanding of the value of basal metabolism tests in clinical medicine must be based on a knowledge of the physiology and technique of the test, and of the factors which may cause deviation from the normal in health and disease.

The rate of heat production in the body varies throughout the day and night according to the amount of physical and mental activity. In order to compare the rate of heat production of different persons measurement must take place under certain arbitrary conditions, and the state found to be most convenient for comparison is when metabolism is reduced to the minimum necessary to keep the body alive under conditions of complete rest. Metabolism reduced to its lowest level is known as basal metabolism, and for practical purposes is most nearly attained after a night's rest in the horizontal position, no food having been taken for 12 hours and no movement having taken place before or during the test. For the rate of heat production in different persons to be compared allowance must also be made for differences in weight and height, or what is found to be more exact, for differences in surface area. In practice the latter is calculated from the two former factors, and the unit of comparison is taken to be the number of calories produced per square metre of skin per hour under basal conditions. Lastly, allowance also has to be made for the normal variation for age and sex. When all these factors have been taken into account, the basal metabolism is expressed as a percentage above or below normal for the size, age, and sex of the subject. Variations of 15 per cent., plus or minus, may occur in patients who are otherwise apparently normal.

Technique.

The *Douglas bag* method is the one most commonly used in this country for estimating the basal metabolism. Briefly, the method is as follows. A sample of expired air is first collected under basal conditions over a measured period of time. The amount of CO_2 in the sample, the total amount of expired air, and the respiratory quotient are then measured, and the amount of oxygen absorbed calculated from these data.

An alternative method which in careful hands is sufficiently accurate for clinical purposes makes use of the *Benedict student apparatus.* The subject breathes into a closed circuit containing oxygen, a measured quantity of pure oxygen being introduced as it is absorbed. The time taken for the absorption of a known quantity of oxygen is measured, and from this data the basal metabolism is calculated. This method is quicker than the Douglas bag method, but is less accurate.

Whatever method is used, it is important that its accuracy shall be confirmed from time to time on a series of normal controls.

For accurate estimations it is important that the subject shall breathe normally both before and during the test, since nervousness and excitement, by increasing the muscular effort of respiration and causing over-breathing may lead to a large error. This applies particularly to patients with hyperthyroidism. It is important, therefore, for patients to become accustomed to breathing into the respiration apparatus before the actual measurement is made. Mental excitement during the test must also be avoided. Du Bois describes the case of a patient in a large calorimeter whose metabolism unaccountably rose 10 per cent. It was finally discovered that the patient had seen through the window of the calorimeter someone whom he disliked intensely. The amount of practice required before normal respiration is established varies greatly in different patients. The first estimation, however, should always be discarded, as the error is likely to be high.

Sources of Error.

To appreciate the clinical value of these tests it is necessary to understand the many ways in which error may arise. The greatest regulator of the rate of metabolism is the thyroid gland. It has been shown in a large series of cases of myxœdema that for every mg. of thyroxin absorbed the basal metabolic rate is increased by 2·5 per cent. Consequently it is in diseases of this gland that basal metabolism tests are most often made. There are, however, other states of disease in which the metabolism may be altered, and these must be allowed for in interpreting basal metabolism readings in thyroid disease. To give a crude example, extreme undernutrition and hyperthyroidism may be associated in the same patient. The former will tend to lower the metabolism and the latter to raise it, so that the resultant reading will be far from an indication of the degree of hyperthyroidism. During starvation the basal metabolism falls to a low level. Benedict's experiments on the fasting man, Levanzin, showed that heat production fell gradually from the start, and was 30 per cent. lower on the twenty-first day of starvation. In states of moderate undernutrition there is evidence to show that the metabolism is almost unchanged, while in children between the ages of 8 and 12 there is an increase. The effect of fever on the basal metabolism is profound and must never be forgotten. According to Du Bois, the average increase is 7·2 per cent. for every degree (Fahrenheit) of rise in temperature. In simple or constitutional obesity no very marked deviations from the normal have been proved. In that associated with hypopituitarism there is a lowering in some cases. In diabetes mellitus the depression of the basal metabolism has been shown to be proportional to the severity of the disease. In mild cases it is normal, while adequate insulin treatment tends to restore the metabolism to normal in severe cases. In secondary anæmia the observations of Boothby and Sandiford reveal a normal basal metabolic rate in nearly all cases, whereas in pernicious anæmia their cases showed a raised rate. In leukæmia and polycythæmia the basal metabolism is, according to most authors, definitely high.

From the foregoing list it can be seen how essential it is to assess basal metabolism results in conjunction with clinical findings, and when using the test in thyroid disease the possible effects of coexisting disease of another kind must not be forgotten.

Myxœdema.

Myxœdema is caused by a diminution in the secretion of iodothyrin by the thyroid gland, and the basal metabolism may fall as low as 50 per cent. below normal. In such severe cases a single estimation is useful in confirming the diagnosis and in giving an estimate in figures of the severity of the disease, and an idea of the amount of thyroid which will be required in treatment. The actual dosage, however, must be regulated more by the clinical condition than by the actual test. The state of the cardiovascular system is all important, for severe cases of myxœdema often have myocardial degeneration; thus any speeding up of the metabolism of the body, which throws extra strain on the heart, must be done slowly and cautiously. Clinically the test is of greater value in diagnosis in borderline cases of myxœdema, in cases of other disease in which a coexisting thyroid deficiency is suspected, and in partially treated cases of myxœdema coming under observation after previous indiscriminate treatment. In such cases a reading of 15 per cent. below normal is strongly suggestive of thyroid deficiency. Repeated estimations during treatment with thyroid preparations are of greater value than single estimations in judging the dosage required to maintain the metabolism at a normal level.

Estimations of basal metabolism might be of great value in the early diagnosis of *cretinism.* Unfortunately the difficulties of performing the test accurately in children are very great, and no method has yet been devised which is of practical value in routine clinical work.

Hyperthyroidism.

In conditions of over activity of the thyroid gland basal metabolism tests have their greatest clinical application. In severe cases of both exophthalmic goitre and toxic adenoma single controlled estimations are a useful confirmatory indication of the severity of the disease, while tests repeated at intervals are used to indicate progress during treatment. In very severe cases of hyperthyroidism the rate may rise to 100 per cent. above normal. In moderately severe cases +40 per cent. is a frequent figure. Of the clinical signs the pulse-rate is the sign which bears the most constant relationship to the metabolic rate. This relationship may, however, be disturbed by additional cardiac complications, such as annular fibrillation or myocardial degeneration. Above 40 per cent. the diagnosis is usually clear and does not need instrumental confirmation. In severe cases isolated tests are therefore of little use, and may worry the patient unnecessarily. Repeated tests, however, at intervals of a week or ten days are of great value in estimating the patient's reaction to rest and medical treatment and the urgency of operation. In borderline cases of hyperthyroidism the test is of diagnostic value. The syndrome of nervousness and tachycardia is a common one, and it is often difficult to distinguish the rapid pulse-rate and nervousness of functional disease from early Graves's disease. A basal metabolic rate raised 15 per cent. in such a case strongly favours the latter diagnosis. Here it must be remembered, however, that the nervous patients are just those who may have most difficulty in breathing normally during the test, and are likely to give an error on the high side.

In cases of long-standing goitre the test has the same value in the diagnosis of oncoming hyperthyroidism, for once this is confirmed by a basal metabolism raised 15 per cent. or more operation becomes an imminent consideration.

The foregoing remarks apply to cases of hyperthyroidism in which no iodine has been given. Iodine has a profound and as yet unexplained action on the basal metabolic rate in exophthalmic goitre, and if it has been given this fact must be taken into consideration. When it is first given the basal metabolism in nearly every case falls to a normal level in from one to three weeks while iodine is continued. At the same time the signs of the disease grow less; the exophthalmia, tremor, and nervousness abate, and the pulse is slowed, although it rarely reaches normal. As a result of the diminished metabolism the unpleasant sense of heat experienced disappears and the patients are cooler and quieter. This state of affairs is not maintained, and after a period of a few days or weeks, even if iodine is still given, the basal metabolism rises steadily again and there is a parallel clinical relapse, though this does not reach the former level of severity for some time. If iodine is discontinued the relapse is sudden, and the basal metabolism rises rapidly. In a few cases there may be clinical relapse without a corresponding rise in the metabolic rate. I have seen two patients who had been taking Lugol's iodine continuously for six months, and although they both showed all the signs and symptoms of severe exophthalmic goitre, their basal metabolic rates were −9 and −13.

The clinical interpretation of basal metabolism readings in patients with hyperthyroidism who have been taking iodine must, therefore, depend on a consideration of the history of iodine medication. Isolated estimations in those who have been taking iodine irregularly or for a long period are of no value. The most useful application of iodine in exophthalmic goitre is in producing an artificial remission of the disease at the time of operation and preventing post-operative crises. Ideally the best time for operation would appear to be when the basal metabolism has been reduced to normal or as near normal as possible with iodine. A series of estimations during the period of preparation will determine when this optimum has been reached, and is then a useful confirmation of clinical observation.

The test is also of value when, in spite of a partial thyroidectomy, some signs of hyperthyroidism persist or recur. Then a constant increase of 15 per cent. or more may indicate the necessity for removal of a further portion of the gland. Occasionally cases occur after operation in which a rapid pulse and slight exophthalmos are associated with other signs suggestive of myxœdema. In such mixed cases constant readings either above or below normal give a better indication of the activity of the thyroid gland than clinical observation.

Conclusion.

To sum up, basal metabolism tests are of greatest value to the clinician in borderline cases of hyper- or hypothyroidism. Readings of 15 per cent. above or below normal are strong confirmatory evidence of a disordered output of the thyroid gland. Repeated estimations are useful in following the course of a disease and its reaction to treatment. There are, however, other causes, apart from thyroid disorders, which alter the metabolism, and these must also be considered in interpreting results. As Mackenzie has pointed out in the study of heart disease, the goal of precise methods is to enable us to dispense with them as soon as we have learned all that they may be able to teach us; so it is with basal metabolism tests, but at present they form a useful aid in diagnosis and in checking treatment.

LESLIE COLE, M.D. Camb., M.R.C.P. Lond.,
Hon. Assistant Physician, Addenbrooke's Hospital, Cambridge.

Special Articles.

MODERN PHYSICAL TREATMENT IN RELATION TO RHEUMATISM.

BY R. FORTESCUE FOX, M.D., F.R.C.P.,
PRESIDENT OF THE LIGUE INTERNATIONALE CONTRE LE RHEUMATISME.

II.[*]—CONTINENTAL PRACTICE AND TEACHING.

IN the early part of last century a widespread popular movement originated in Central Europe for the use of external remedies, and especially of cold water. The peasant, Priessnitz, established his "water-cure" on the Gräfenburg in 1830 and formulated, with real genius, a regimen of simple habits and diet, with baths and applications, exercises and perspirations, which certainly proved itself of spectacular benefit to large numbers of sufferers from chronic ailments. Unfortunately, in the hands of his followers this teaching became too soon a rigid and lifeless system. Rickli followed, with his "atmospheric cure" on the shores of the Austrian lake Valdes (now Yugoslavia). He upheld the healing virtues of light and water and air; water was from the earth, air was an intermediate agency and, most potent of all, light came from the heavens. Such invocation of the elements, although a revival of ancient teaching, was in sharp opposition to the accepted medical teaching of the times. The traditions of Rickli still linger in the establishments in that country dedicated to "natural remedies." Lastly came Father Kneipp at Wörishofen, near Munich, who preached to throngs of health-seekers from all countries the virtues of cold water in the morning air and sunshine. Elderly patients are still living who tell of the astonishing benefit they derived for a languid circulation and cold extremities from walking barefoot in the dewy grass.

This recourse to physical remedies by multitudes of persons of all classes seems now an almost instinctive movement of reaction from artificial medication. If only we could give to our medical instincts the support of knowledge and to our medical knowledge the authority of instinct! It became necessary to study seriously these unsuspected or neglected methods of treatment. In Central Europe the movement of investigation was led by Winternitz, one of the earliest and greatest pioneers in modern hydrology. His Principles of Hydrotherapy were formulated in 1877, and from that date onwards he amplified and illustrated his theme in a remarkable series of experimental studies carried on in his clinic at Kaltenlautgeben near Vienna. To the work of Winternitz and of his pupils, many of whom are still living, is attributable a great part of the existing knowledge, still far from complete, of the actions and uses of heat and cold upon the human body in health and disease.

In the present century hydrotherapy and other forms of physical treatment have been brought into fresh prominence by their use for military cases in most European countries as well as in America, Canada, Australia, and New Zealand. One idea, or hypothesis, or method, or technique, succeeds to another, and it is not unnatural that the use of some particular form of energy such as radiotherapy, heralded by dazzling discoveries, should temporarily occupy the entire field without regard to its indispensable allies.

Hospital Departments in Germany.[3]

In most general hospitals physical treatment of one kind or another, such as electricity and massage, is employed, and in some of these hospitals, as in England, the physical departments are becoming more comprehensive.

A physical treatment department of a comprehensive character forms a constituent part of the great *Barmbeck Hospital* at Hamburg. Four pavilions are allocated to this section, which is under the direction of Prof. Eric Plate. About 1100 patients, for whom physical methods of treatment are considered desirable, are admitted to the hospital every year. Heat and movement in many forms are employed for rheumatic cases and simple apparatus for measuring the deformity and immobility of joints. Just emphasis is laid upon complete investigation of the patient's general condition, since a disturbance of other functions is often associated with articular disease. Three laboratories are attached to the physical section, and a considerable amount of original work is carried on.

The physical treatment department at the *Rudolf Virchow Hospital* at Berlin, of which Dr. A. Laqueur is the director, has no beds, but serves for in- and out-patients from the entire hospital. The methods of treatment employed are five—water, mechanical treatment, diathermy, light, and electricity. In the last year the number of treatments given was in round figures as follows: water, 34,000; mechanical treatment, 10,000; of the other three, each 8000. The average duration of physical treatment was from four to six weeks. A similar department under the direction of Dr. Ernst Freund forms part of the University Clinic at Vienna.

A physical section at the great civil hospital at *Strasbourg* was opened by the Germans in 1912, mainly for the insured population, and serves for the hospital itself and for out-patients from the city. The large central bathing hall is maintained at a temperature of nearly 70° F. and contains a circular pool divided into sectors at different temperatures.

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[*] Part I. appeared last week.

[3] Fox and Mautner, M.: Appendix to Ministry of Health Report on Chronic Arthritis, London, 1928.

Around the room there are compartments and appliances for treatment by vapour, fango packs, douches, radiation, &c. Various forms of local treatment, such as diathermy, hot air, and manipulation, are given in a suite of rooms on an upper floor.

Spas and Sanatoria.

In continental countries, as in England, the chief spas are equipped for comprehensive physical treatment. All well-established spas may be regarded as health resorts for physical treatment, in which the local waters and climate play an essential part. But of late years, and especially since the war, when the cult of rays has rather dazzled the world, radiotherapy and the other accessory physical methods of the spas have been multiplied and magnified and in many places have temporarily eclipsed the use of the waters.

A reaction is now in progress. It is recognised that the multitudinous conditions presented by differing forms of incipient and chronic disease require many kinds of physical treatment, and that the value of the spas and health resorts must in the end rest upon their natural endowment and their distinctive methods.

Physical treatment, including in each case the local spa treatment, is used at the spa hospitals even more extensively than in England. The local baths and waters, with accessory methods, were much used for disabled soldiers at the military spa hospitals in France and the Pro Patriá Hospital at Pistany and in many other localities. Recent buildings like the Landesbad at Aachen have been even more completely equipped for combined physical and spa treatment. The extensive use of physical methods, including hydrotherapy, in public and private sanatoria throughout Central Europe must not be forgotten.

Clinics for Physical Treatment in the Towns.

A large proportion of the patients treated at the physical departments of hospitals and at the spas in Germany and Austria are insured persons. The great medical and social significance of the health insurance system may be gauged from the fact that insured persons now number in many places, as in Strasbourg, nearly one-half of the population. In Germany and Austria they are members of friendly societies (*Krankenkassen*), by whom facilities for treatment are arranged. So large, however, are the numbers of the insured, intellectual as well as manual workers, for whom special methods of treatment are required, that it has become necessary to set up clinics for physical and other forms of treatment in the towns. These clinics are in fact in those countries provided by the societies for the benefit of their members.

A palatial new clinic of this character has been lately opened in succession to smaller establishments at Hamburg. In Saxony what are called the "natural methods" of treatment have long enjoyed great popularity, and it is significant that the amount now spent by the societies, in Dresden for example, for baths and massage exceeds one-third of the total payments to chemists and druggists. At the great clinic at Dresden, which was opened just before the war, the figures showing the total number of treatments for the last available year are approximately: water, 90,000; light, 48,000; electricity, 47,000; inhalations, 9000; exercises and mechanical treatment, 8000. From 400 to 500 cases are here treated daily. It is stated that the milder forms of treatment by baths and hot air are especially popular in Dresden with rheumatic patients, who sometimes wish to continue such treatment when it is no longer necessary on medical grounds.

In Berlin the associated societies, with nearly a million and a half members, have more than 40 ambulatoria or out-patient clinics. In these establishments medical advice is given to the members on a great variety of special subjects. Physical treatment of one kind and another is installed at most of these clinics. The Central Ambulatorium in Berlin is equipped with a complete hydrotherapeutic department, with baths in porcelain and wood, for various forms of medical baths, as well as appliances for hot air and vapour, fango, light, diathermy, and mechanical treatment. The current figures show a total of 157,000 treatments per annum, of which about one-half were given in the hydrotherapy department.

Many other town clinics have been set up by the societies in German and Austrian cities. At some of these large numbers of cases are treated. The establishments vary very much in equipment, in their medical and general organisation, and in the degree of skill and accuracy with which the treatment is carried out. Although many of them are doing excellent work, there appears to be at most of these clinics little or no effort made at serious investigation, either of the cases treated or of the methods of treatment employed. Moreover, although they follow identical objects and methods, their organisations appear to lack central guidance and coördination.

Current Teaching.

The current medical teaching on physical treatment in Germany has been recently set forth in some recent handbooks by several of its leading exponents. Dr. Laqueur[4] bases his conclusions on many years' experience in his department in Berlin where some 3000 cases annually are under treatment by physical methods. Like the other authors cited, it is his practice to use hydrotherapy in conjunction with radiation, electricity, and movements. There is general agreement among all these writers that the value of hydrotherapy is insufficiently recognised, both in acute and chronic disease. Laqueur holds that recent work has clearly established the action of baths upon the vegetative nervous system and blood pressure and also their stimulant action upon metabolism in addition to their more local effect in the production of hyperæmia.

Dr. George Hauffe, in his most recent work,[5] reaffirms conclusions which are founded on experimental work carried out at Dr. Kraus's University Clinic at Berlin. Hauffe has studied the effects of cold and heat upon the circulation in the partial or half-bath, given at a slowly increasing temperature, often up to the limits of toleration. Changes in the distribution of the blood are shown by the plethysmograph attached to the *untreated* arm. The arm bath at temperatures rising to 42° C. produces an increase of volume in the arm, but it is interesting to note that experiments on healthy and diseased individuals show different results. Hauffe holds that any kind of slowly increasing stimulus may produce an increasing dilatation of the peripheral vascular system, whilst violent or sudden stimuli of all kinds cause contraction of this system. The "reservoir of the circulation"—that is to say the heart, pulmonary circulation, and the larger vessels of the body cavities—is distended when the peripheral circulation is contracted and vice versa. This statement may be compared with the fact that in the tropics and in hot baths the amount of blood circulating in the skin may be enormously increased (according to some observers up to 50 times the normal), a fact which led Joseph Barcroft to suggest that the volume of circulating blood may be temporarily increased.[6] Hauffe believes that, since the coronary and bronchial vessels belong to the peripheral system, the state of nutrition of the heart and lungs can be deduced from a study of the cutaneous vessels. The physician, he adds, who wishes to understand hydrotherapy must be willing to get his hands wet, just as the surgeon gets used to the knife.

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[4] Laqueur, A.: Praxis der Physikalischen Therapie, Berlin, 1926.

[5] Hauffe, G.: Physikalische Therapie des praktischen Ärztes, Berlin and Vienna, 1926.

[6] Quoted by Sandstroem: The Physiological Aspects of Tropical Climates, Phys. Rev., April, 1927.

A convenient and systematic handbook on hydro- and thermo-therapy[7] is the work of Dr. Ernst Tobias, who has for many years conducted a course of instruction for practitioners. He deals with all the most convenient forms in which heat is applied in practice, especially in the treatment of nervous disease. Whilst the peripheral sensitiveness to pain and touch is increased by short applications of heat or cold, prolonged warmth, as in "sedative" baths, *greatly diminishes this sensitiveness. The hypothesis* of Goldscheider is cited that the stimulation of thermal nerves inhibits the spinal pain centres, and that "the sensation of warmth displaces the sensation of pain."

Dr. Walter Krebs, who is in charge of the large Landesbad Hospital for the Rhine provinces at Aachen, has written a short treatise on the foundations of hydrotherapy.[8] In this hospital all kinds of physical treatment are given, as well as surgical and medical treatment of other kinds, and important research work is being carried on in connexion with the German Society for Combating Rheumatism. It is, in short, an "arthritic unit" of the type foreshadowed by the British Ministry of Health.

(To be concluded.)

A NOTE ON THE

GRAPHIC METHOD OF GRADUATION IN THE CONSTRUCTION OF LIFE-TABLES.

By HILDA M. WOODS,
ASSISTANT LECTURER IN EPIDEMIOLOGY AND VITAL STATISTICS, LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.

ALTHOUGH the importance of expressing mortality data in life-table form can be exaggerated (Greenwood),[1] the use of life-tables in affording summary comparisons of place with place or epoch with epoch is considerable. In the past, medical men have been rather daunted by the "mathematical" appearance of the methods of construction. It has been our experience in the Division of Epidemiology and Vital Statistics of the School of Hygiene and Tropical Medicine that even the short methods, facilitated by Dr. E. C. Snow's tables, do not appeal to the, unfortunately, numerous medical men who look on equations or formulæ with mingled awe and aversion. There is not, of course, any magic about arithmetical methods of graduation. The only superiority they possess over the dexterous use of a lead pencil is that, *if* the necessary sums are worked out accurately, all the users of the same formulæ must reach the same results, while no two wielders of a pencil will draw precisely the same curves. The practical question is whether the answers differ to an extent which matters in any public health application.

The graphical method of interpolation was first employed by Milne in the construction of the Carlisle table in 1815, but for a long time there was much uncertainty as to the precise method he used to obtain the population and deaths at the individual age-periods. It was not until 1883 that King[2] proved conclusively that Milne had adopted graphical interpolation to obtain his values. Graduation by the graphical method is extremely simple and requires little knowledge of mathematics. Briefly the process is as follows: to find the number of lives at risk for individual years of life from the quinquennial and decennial groups of ages, mark off along the abscissa line equal portions for the quinquennial groups of ages and double length for the decennial age-groups; then construct a series of rectangles equal in dimensions to the population at each of the separate age-groups, and draw a continuous curved line through the upper part of each of the rectangles. The curved line must never change its course so as to form an angle in its path, it must so cut each of the rectangles that the area cut off is equal to the area added, and the sum of the values read off from the curved line bounding the space above must be equal to the total area of the rectangle. The same process is followed to obtain the deaths at individual ages from the deaths in age-periods.*

Newsholme used Milne's graphic method in the *construction of the Brighton life-tables (1881–90* and 1891–1900), and the same process was adopted by Tattersall for the Oldham life-table (1881–90). No attempt was made to compare the result of the graphic method with that of mathematical formulæ until Hayward[3] discussed improved analytical methods for the construction of life-tables and tried his formulæ on the Brighton data 1881–90. He found, somewhat to his surprise, that, comparing Newsholme's values for the expectation of life, the graphic method gave a remarkably close approximation to the result of the analytical. He also showed in a later paper[4] that inconsistent results could be obtained by employing different analytical methods, and it was not wise to compare life-tables unless they had been calculated on a uniform plan. Newsholme and Stevenson[5] discussed the comparative value of the two processes for constructing life-tables, and in the same paper published a full and clear description of the graphic method based on the experience of Brighton in 1891–1900. They pointed out that neither the graphic nor the analytical method could be relied upon to give accurate results for ages 0–5, nor for ages 85 and upwards, owing to the untrustworthiness of these ages of the census and death returns. For intermediate ages they considered that the graphic method was undoubtedly preferable to the analytical because it was easier, more expeditious, and the results (see table below reproduced from Newsholme and Stevenson's report) were in close agreement with those obtained by the analytical.

Brighton (Males) Life-table, 1881–90.

"G." = graphic method (Newsholme). "A." = analytical method (Hayward). Diff. "A.," "G." = differences of "A." from "G."

—	"G."	"A."	Diff. "A.," "G."	—	"G."	"A."	Diff. "A.," "G."
E_0	43·59	43·56	—0·03	E_{45}	22·36	22·36	±0·00
E_5	52·87	52·88	+0·01	E_{55}	16·48	16·46	—0·02
E_{10}	49·12	49·12	±0·00	E_{65}	10·96	10·94	—0·02
E_{15}	44·67	44·66	—0·01	E_{75}	6·64	6·58	—0·06
E_{20}	40·55	40·51	—0·04	E_{85}	3·33	3·46	+0·13
E_{25}	36·51	36·51	±0·00	E_{95}	1·68	1·2	—0·46
E_{35}	29·02	29·04	+0·02				

As a further test I applied the graphic method to the data of England and Wales for 1901–10, and compared the expectations of life with those found by King for the same period (English life-table No. 7, males). My results are in such close agreement with those of King that it seemed worth while putting the results on record.

With the England and Wales data one is dealing in millions, not as in Newsholme's case in thousands, and it was not, of course, possible to obtain the same degree of accuracy in reading off the figures from the curve without constructing a curve on such a large scale as to become unwieldy. The central population for the individual years of life were only taken to the nearest 10,000, and the numbers dying at each age in hundreds, but, as will be shown, this did not materially worsen the results. The distribution under five years was based on births and deaths, and from age 85 upwards the curves of populations and deaths were reconstructed on a much larger scale. Newsholme used the method of differences for this part of his table for the sake of greater exactitude. No attempt was made at refinement with the England and Wales figures, the aim being to work out the table on the simplest possible lines.

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[7] Tobias, E.: Hydro- und thermo-therapie von Inneren und Nervenkrankheiten, Berlin and Vienna, 1923.

[8] Krebs, W.: Grundriss der Hydrotherapie, Bonn, 1923.

* For a full description of the method see Newsholme and Stevenson, Jour. of Hyg., 1903, iii., 297.

Expectation of Life. England and Wales, 1901–10.

G.M. = graphic method $\overset{\circ}{e}_x$. K.E. = King's English life-table. No. 7, $\overset{\circ}{e}_x$. P.c. diff. = per cent. difference.

Age.	G.M.	K.E.	P.c. diff.	Age.	G.M.	K.E.	P.c. diff.
0	48·91	48·53	0·8	45	23·35	23·27	0·34
5	55·97	55·90	0·13	50	19·81	19·76	0·25
10	51·92	51·81	0·21	55	16·54	16·48	0·36
15	47·43	47·31	0·25	60	13·56	13·49	0·52
20	43·12	43·01	0·26	65	10·82	10·80	0·19
25	38·98	38·86	0·31	70	8·37	8·39	0·24
30	34·94	34·76	0·52	75	6·48	6·41	0·11
35	30·90	30·79	0·36	80	4·70	4·86	0·33
40	27·07	26·96	0·41	85	3·58	3·53	0·14

Although the results of the graphic method, compared with King's figures, rather over-estimate the expectation of life, the difference never amounts to 1 per cent. Such small discrepancies suggest that results sufficiently accurate for all practical purposes can be obtained by this simple method of graduation.

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1. Greenwood, M.: Value of Life-tables in Statistical Research, Jour. Roy. Stat. Soc., 1922, lxxxv., pt. iv., 537.
2. King, G.: On the Method Used by Milne in the Construction of the Carlisle Table of Mortality, Jour. Inst. Actuaries, 1883, xxiv., 186.
3. Hayward, T. E.: Life-tables: Their Construction and Application, Jour. Roy. Stat. Soc., 1899, lxii., 699.
4. Same author: A Series of Life-tables for England and Wales for each Successive Decennium from 1841–50 to 1881–90, Calculated by an Abbreviated Method, Jour. Roy. Stat. Soc., 1901, lxiv., 636.
5. Newsholme, A., and Stevenson, T. H. C.: The Graphic Method of Constructing a Life-table Illustrated by the Brighton Life-table, 1891–1900, Jour. of Hyg., 1903, iii., 297.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

A General Medical Council for France.

THE scandals in the medical profession, recently given unsympathetic publicity in the lay press, have brought to a head a scheme which has long been brewing, and which only needed the impetus of several shady transactions to coax it into the open. This scheme is nothing short of a General Medical Council, which, it is hoped, will enable the medical profession to put its own house in order. Its essential features were outlined by Prof. V. Balthazard at a recent meeting of the Académie de Medécine. As he pointed out, the medical corporations in former times, acting under the ægis of the Faculties of Medicine, kept their members very strictly in the narrow path of virtue, and long after the disappearance of these corporations their disciplinary influence survived. The law of 1884 did not equip the medical syndicates with the necessary means to enforce discipline; for not only were doctors free to decline membership thereof, but the syndicates were unable to impose their will in delicate matters of medical etiquette. A syndicate might blame, or, in extreme cases, exclude from its membership a peccant doctor, but such action did not necessarily terrify him into better ways.

The sort of council which Dr. Balthazard asked the Académie de Médecine, as chief guardian of the interests and honour of the medical profession, to recommend to the Government, is a body which would control every doctor, and which would have powers enabling it in extreme cases to deprive an offender of his legal right to practise medicine. Anticipating the objection that the lay tribunals already deal with offences committeed by doctors, Dr. Balthazard remarked that such tribunals are incapable of dealing with the doctor who lapses into charlatanism, who advertises himself in a manner calculated to discredit his profession, or who gets entangled in collusionary transactions which are ethically, rather than legally, shady. After discussing the proposed machinery of this new body, which is, of course, to be composed of doctors elected according to certain well-defined rules, and from the decisions of which appeals can be made to a yet higher power, Dr. Balthazard gave an account of the ethical code by which the new Council would be guided in its decisions. On a later occasion it would be interesting to review this code at some length, and as a foretaste of this review, it may be noted that, in the matter of dichotomy, a business-like solution is proposed. It is suggested that the medical practitioner shall be entitled, with the full cognisance of his patient, to a percentage of the special fees, his share being proportional to the importance of the part he plays himself, and never exceeding 25 per cent. On the recommendation of the President Dr. Balthazard's proposition was referred to a special committee of which he is a member. In discussions of this kind the Anglo-Saxon doctor must sometimes ponder over his Latin confrère's use of the term "client" when speaking of the person described in Anglo-Saxon countries as the "patient." Is it that we Latins are more commercially minded than our colleagues on the other side of the Channel? Or are we simply (one hesitates to suggest a train of thought culminating in any claim to superiority) more candid?

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Cruelty to Children.

THE Royal Scottish Society for the Prevention of Cruelty to Children continues its admirable work under the Children Act. This society is, I should think, unique in Scottish administration in one respect—namely, it has a statutory function under the Children Act. It has power to make investigations into all cases of cruelty that are brought to its notice and to take the initiative in bringing the facts before the responsible authorities. The Children Act is extremely difficult to administer, and the welcome it had as the "Children's Charter" has ended, on the whole, in disappointment. The primary reason no doubt is that there is no single authority responsible for its administration as a whole. Meanwhile, the Cruelty Association, or, as it is known among the people affected, "The Cruelty," continues, in its own field, to maintain its high standard of work as a voluntary body acting officially. Of over 100 cases coming before the society last year less than 4 per cent. ended in prosecution. This means that 96 per cent. of the cases are handled directly by the society officials.

The Campaign against Tubercle.

The Royal Victoria Hospital Tuberculosis Trust continues its activities from year to year. This is the fortieth anniversary of the Victoria Dispensary for Tuberculosis. The idea of the dispensary as the basis of a comprehensive scheme was converted into reality by Sir Robert Philip long ago and has spread over the world. The Victoria Dispensary opened its door in Bank-street, Edinburgh, on Nov. 22nd, 1887. At that date it stood alone. The 40 years have allowed the committee gradually to develop the extensive programme of the Edinburgh scheme. Following the Victoria Dispensary, the scheme included the establishment of the sanatorium (the Royal Victoria Hospital) tuberculosis school, the working colony, the sanatorium colony of Southfield, the tubercle free dairy farm, and the Chair of Tuberculosis in the University. In 1914 the committee transferred in gift to the city of Edinburgh three large institutions which constitute the chief factors in the corporation's tuberculosis equipment.

This year's report, therefore, is important as containing the historical beginnings of a very great movement. Although tuberculosis continues to be a serious cause of crippling and death, its fatal grip is everywhere relaxing. Every local authority in Britain now has a scheme of greater or less comprehensiveness, and the attack of all forms of tuberculosis is maintained with unfailing force. Yet the cases continue to occur in their thousands, and we are very far from mastery anywhere. The disappointments with methods have been numerous, although there has been much good result. But the disappointment has usually been due to the failure to recognise the universality of the infection and the failure to act early enough.

> "One of the most significant advances has been the gradual shifting of the doctor's outlook from the adult or adolescent patient to the child. . . . A remarkable result of the widespread acceptance of this view is to be found in the now frequent requests from doctors, both medical officers to local authorities and private practitioners, for the admission of young children to Southfield. This is all to the good. Still, much more is needed. . . . The advent of tuberculous infection—almost inevitable under present conditions—should be watched for and appropriate measures taken to ensure that the infection becomes practically innocuous. The adoption of this procedure as routine practice by every doctor would hasten immeasurably the ultimate disappearance of gross disease."

Meanwhile, there is abundant room for research, and workers are not without hope that one day a direct antidote will be discovered.

The Hospital Question.

In Scotland it is becoming clearer that with the steadily increasing demands on the part of the public for hospital accommodation for diseases like pneumonia and influenza, coöperation of the voluntary hospitals with the public bodies is essential; but where such coöperation is readily given the position of the voluntary hospitals is being made more and more secure, since the official hospitals, by careful adjustment, can enable the voluntary hospitals to do the best work they are capable of in higher medicine and surgery. It is to be expected, as time goes on, that the hospital treatment of bronchitis, rheumatism, and other general diseases will steadily demand more accommodation. So far as Scotland is concerned, however, the new local government measure promises well.

At the Elsie Inglis Memorial Maternity Hospital 712 patients were admitted in the year ending Nov. 30th. This was a falling off, as against the previous year, of 152, but the decrease was due to the increase in the number of antenatal cases admitted involving a prolonged stay. There were in all 279 weeks of antenatal care as against 186 in the previous year, and this is a good index of the trend of modern treatment. In the three and a half years since the hospital was opened the experience of the patients from the neighbourhood has shown the special need of antenatal rest and care and a higher standard of health for the expectant mother.

IRELAND.

(From our own Correspondent.)

An Outbreak of Enteric Fever.

There has recently been a serious outbreak of enteric fever in the town of Carrick-on-Shannon which has now been traced to a grossly infected water-supply. The water-supply comes from the river Shannon, and the intake is by a pipe which is not more than 15 feet from an open drain carrying the sewage from the fever hospital. Between Jan. 6th and March 14th eight typhoid patients from the neighbourhood of Ballinamore were treated in the fever hospital. Dr. Robert McDonnell, one of the medical inspectors of the Department of Local Government and Public Health, has investigated the outbreak, and his report was published last week. He found that owing to leakages and breaks in the pipe there was direct connexion between the fever hospital sewer and the pipe carrying water to the town. He recommends that a water-supply should be provided from a new source, and he suggests Corbally Lake as a source. As long as the town is dependent on the river for its supply it is always in danger of an epidemic. The village of Leitrim is on the banks of the Shannon, only four miles above Carrick, and a single case of enteric occurring in that village would be a serious menace to the health of the people of Carrick. Dr. McDonnell adds that the conditions in Carrick are the direct result of the complete absence of health organisation. If the county had the services of a county medical officer of health with a trained sanitary staff the outbreak could not have occurred. He adds that many of the medical practitioners in the county neglect their statutory duty of notifying cases of infectious disease. The outbreak has caused several deaths, including that of the member of the Dail for the district.

UNITED STATES OF AMERICA.

(From an Occasional Correspondent.)

Medicinal Use of Alcohol.

In curious contrast to the news reaching us from England that alcohol is now prescribed much less frequently than it was a few years ago are some statistics recently published by the Bureau of Prohibition of the Treasury Department. In those States which permit the use of liquor for medicinal purposes there are 116,756 licensed physicians. Of these 48,097 were prescribing alcohol in 1927, while last year the number had risen to 68,951. Each physician who prescribes must apply for permission to do so, and if this is granted he is allowed four books of prescriptions per annum. During 1927 one book each was used by 14,948 doctors, two books by 8743, three books by 10,861, and the maximum of four books by 13,545—a rather curious distribution of frequencies. The total number of prescriptions issued during the year 1922 was less than 9 million, in 1927 the number was a little under 12 million—a maximum of 13½ million being reached in 1925. The career of prohibition appears to be reaching something of a climax. Everyone is looking to the new President with the expectation that he will find some way to correct the abuses that have grown up under the administration of the 18th amendment. The "Jones" law, which increases the penalties inflicted on bootleggers, seems to have put a good many of these out of business for the time at least. There is a possibility that juries in some States will refuse to convict under this new law. On the other hand, the State of Wisconsin which voted for Hoover in the presidential election has now recorded an enormous majority against the State prohibition law. This is a blow to the "drys" who have interpreted the result of the presidential election as a mandate for prohibition. The success of prohibition is, perhaps, most fundamentally jeopardised by the now widespread habit of manufacturing wines in the home. Attempts to prevent this involve the need for trespassing upon domestic privacy which in turn is bound to cause popular resentment. A recent incident in Aurora, Illinois, where "dry" agents entered a home forcibly (and it seems illegally), knocked down the father of the family and shot his wife dead, has aroused a nation-wide indignation which is highly significant.

Autopsies in Hospitals.

The Council of the American Medical Association adopted a ruling in 1926 that after Jan. 1st, 1928, hospitals, to secure the recognition for the training of internes of the Association, must perform autopsies in at least 10 per cent. of the deaths occurring in their institution. At the beginning of the present year the requirement was to have been advanced to 15 per cent. The decision has greatly increased the number of autopsies performed, the number of hospitals meeting the first requirement having increased from 64·4 per cent. in 1926 to 93 per cent. in 1928. However, it has been decided to postpone the higher requirement for one year to give some deserving institutions a chance to catch up with others that have been more successful. It is pointed out that those who have succeeded have been able in some cases to secure the coöperation of the public by furnishing a report of the autopsy to relatives who are naturally interested in knowing the cause of death. The maintenance of a well-kept autopsy room to which visitors can be shown is also said to be of assistance in this regard.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

The Teaching of Psychiatry.

IF there is one department of medicine which is conspicuously the Cinderella of Indian medical schools it is that of mental diseases. This is no fault of the mental specialists. Indeed, there are several distinguished psychiatrists who, for many years past, have lost no opportunity of emphasising the urgent need of better teaching facilities for students in their department. The difficulty is, in part, the inadequate provision of hospital accommodation for mental cases on modern lines, which is notoriously expensive; in part the remoteness of existing mental hospitals in comparatively rural surroundings, far from the main teaching centres. But whatever excuse may be made, the lack of facilities is incontestable. Lieut.-Colonel Berkeley-Hill, who feels keenly on the matter, points out, in a lecture recently given at Delhi,[1] that although the term mental hygiene is itself of modern origin, since its introduction in 1907 many advances have been made both in the prevention and cure of mental disease, and that the example of America in founding an association for mental hygiene in 1916 was soon followed by France and England, in both cases with far-reaching results. It may be held, perhaps with justice, that the spate of societies and associations in India does not lead to any increase in honest spade-work, but this is a case where not only the public, but the governments central and provincial, need instruction and stimulation, and there is need for propaganda by some authoritative body. Quite recently the Director of Public Health in the Bombay Presidency, himself a Parsi, drew attention to the prevalence of insanity in the Parsi community, which he attributed to consanguineous marriage. Other Indian communities are addicted to this custom, but no doubt many causes contribute to mental instability, and the first step in the correction of dysgenic racial proclivities is the collection and dissemination of knowledge. This function a society of mental hygiene would be well fitted to carry out.

The Campaign against Leprosy.

A good example of organised inquiry and propaganda is furnished by the progress of the campaign initiated in 1925 by the British Empire Leprosy Relief Association. The situation in India is much more perplexing than it is, for instance, in the Philippine Islands. In Luzon, the large island on which Manila is situated, the population consists principally of Christians, and it was here that the American administration, with characteristic vigour, put into practice many years ago a scheme of wholesale segregation which they were hopeful would exterminate the disease within a generation. A small island was available for isolation, with another nearby for relatives and friends visiting; the people were, on the whole, docile, and easy communication by sea facilitated transit and made it possible for a roving medical commission to carry out inspection. The procedure, it appears, has not been as successful as had been expected, and any such wholesale regulation would have been impossible in India, with its diversities of race and creed. Indeed, even in the Philippines it was considered unwise to go so far with the turbulent Mohammedan population of the island of Mindanao. The tendency in India has been to proceed on the lines of least resistance. The number of lepers, even according to the incomplete census returns, is enormous, and it has been left to private charity and to the exertions of the Mission to Lepers, supplemented by small grants from public funds, to deal with the problem on an infinitesimal scale by the establishment of asylums.

Now, however, in the space of a few years, and with the assistance of very moderate funds (the result of a viceregal appeal which, unfortunately, coincided with a period of financial stringency) the Leprosy Relief Association has put a new spirit into the crusade. Recognising from the start that any kind of extensive scheme of compulsory segregation was out of the question, the Association concentrated on research and propaganda, coupled with facilities for instructing selected members of the medical profession in treatment and policy. In the words of Dr. E. Muir, who is in charge of this department at the Calcutta School of Tropical Medicine and Hygiene, "the old methods of forcible segregation of only that small proportion of the known leper population which exposed itself in begging on the roads—a section, by the way, consisting largely of non-infectious 'burnt-out' cases—are being replaced by voluntary clinics, the training of doctors in the most recent methods of diagnosis and treatment, investigation into local causes of high endemicity, and propaganda based upon such investigation." A party has made sample surveys in Bihar, Bengal, Burmah, the Central Provinces, and Bombay, and where the incidence is heaviest it is hoped to start special leper clinics, or if funds are not at first available for that, to establish leper departments in connexion with existing dispensaries. Some clinics are already in operation, and enough information is now available to show that good results may be hoped for along these lines. As Dr. Muir remarks, although we do not yet possess any single remedy which can be called a specific, we have at our disposal treatment which, when properly administered, will, in the great majority of early cases, rid the patient of all active signs and keep him well, provided he continues to take the proper precautions, and which will also heal up a large proportion of the advanced cases. The effect of recent action is already evident from the way early cases, which formerly hid themselves in despair at the absence of treatment, and through fear of social ostracism, are coming forward to take advantage of the newer methods, where these have been brought to their notice. That the spread of the good news is still very restricted, is, however, well exemplified in a case which came before the Allahabad High Court only four months ago,[2] in which a leper, disgusted with life, was actually helped by his friends and relatives, including his ten-year-old son, to commit suicide by throwing himself into the Ganges. This incident took place near the city of Meerut. A procession was formed, the voluntary victim was bathed, dressed in clean clothes, and fed on sweetmeats, after which he was taken to the river bank and pushed in by his friends and relations.

It is not very long ago since *mata devi*, or small-pox, was everywhere regarded in India as an inevitable scourge of the gods. Surely people who have had the intelligence to appreciate the benefits of vaccination may be expected to display similar discernment in the case of leprosy, and to accept the relief which modern methods of treatment offer.

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[1] Indian Medical Gazette, February, 1929.

[2] The Pioneer Mail, March 1st, 1929.

AUSTRALASIA.

(FROM OUR OWN CORRESPONDENT.)

Treatment of Cancer in New Zealand.

Mr. Sampson Handley's visit to New Zealand has served to focus attention on the facilities for treating cancer in the Dominion. On reviewing the stocks of radium, he gives it as his opinion that the amount available is almost enough to make a serious start with treatment, although the quantities at Auckland and Dunedin seem rather inadequate. There is not enough, however, to make it possible to use all the current methods of employing radium. At present about 320 milligrammes are in use at Auckland, 1 gramme at Wellington, 508 mg. at Christchurch, and 280 mg. at Dunedin. Mr. Handley advocates the establishment of a central institution for the treatment of cancer. He proposes 50 beds for a start, with special cancer wards in other large cities. He further recommends that an experienced histologist be appointed in connexion with the main cancer hospital, and that one of the surgical staff should go abroad for special study. Finally, he urges the necessity of educating the public in the early signs of cancer. His address has received a good deal of notice throughout the daily press of Australasia.

The Health of New Zealand.

New Zealand has always had an enviable record for infant mortality, and figures available for the urban areas (which include over half the population) show that there will be an even lower infant mortality-rate for 1928. There has been a definite downward trend during the past five years, the figures per 1000 births for the urban areas, commencing with 1923, being 50·1, 44·9, 44·7, 44·5, 45·1, and 41·4 in 1928. The last figure thus shows a decided fall. It is expected, moreover, that the final rate for 1928 for the whole population of the Dominion will be even lower, as the Dominion rates compared with the rates for urban areas have been invariably lower for deaths and infant mortality and higher for births. The Dominion rate for 1928 will be awaited with interest; for 1927 it was 38·7. The urban birth-rate, on the other hand, has been the lowest on record, 17·7 births per 1000 of the population. The death-rate shows an increase of 0·07 per 1000. There were no epidemics during the past year, but scarlet fever, diphtheria, and influenza took a greater toll of life than in the previous year. Other diseases showing notable increases were tuberculosis, cancer, heart disease, and pneumonia. Deaths from motor and railway accidents increased, but those from measles, diseases of the nervous system, bronchitis, senility, and diseases of early infancy decreased.

Venereal Disease.

The prevention and control of venereal diseases in Australia is undertaken by the State. Each State has a Venereal Diseases Act, or provisions in the Health Act governing the measures taken to combat these diseases, and in each State anonymous or impersonal notification has been made compulsory. Unfortunately, it is realised that by no means every case is notified by the medical practitioners. What relation exists between notification and incidence can only be guessed at, but probably two-thirds of the cases are notified. The crude incidence-rate for Australia (notifications only) for 1927 was 243 per 100,000 of the population. The figures per 100,000 for the respective States are: New South Wales, 239; Victoria, 304; Queensland, 147; Western Australia, 243; and Tasmania, 170. The figures for South Australia and the territories are not available. The review of the notifications for the past five years shows that there has been a slight fall for the Australian rate from 297 in 1922 to 243 in 1927.

Noise and Health.

Stimulated by the regulations prescribed in France, whereby the sounding of motor-car warning signals is prohibited between the hours of 1 A.M. and 5 A.M., the medical officer of health for Brisbane has suggested to the city council that an ordinance be drafted for the suppression of unnecessary noise. The point was made that the excessive use of the motor horn at intersections is usually an expression of laziness on the part of the driver, and it is safer and less noisy to slow down at intersections than to blare a way through a crossing on the principle of the "survival of the noisiest." Further suggestions have been made to create zones of silence in the residential areas of the city and to exercise a more strict control over the noise made by shunting operations in the railway yards, especially the auditory insult occasioned by letting off steam.

Mental Deficiency in New Zealand.

As part of the administrative machinery of the Mental Defectives Act, 1928, a board has been appointed to control the care, treatment, and training of the mentally deficient in New Zealand. One of the board's first duties will be the compilation of a register of all persons who are "socially defective." Any person whose name is so entered will have the right of appeal to a Supreme Court judge. The board also has the power to establish clinics for the diagnosis and treatment of mental cases. These clinics will be conducted by qualified psychiatrists. Considerable modification of the sterilisation proposals were made during the passage of the Bill.

MEDICINE AND THE LAW.

A Boy's Death from Mercury Poisoning.

AT an inquest held at Islington on April 23rd the death of a boy was attributed to syncope resulting from acute colitis brought about by mercury poisoning. The boy's mother had previously stated that the boy had been under treatment at St. Bartholomew's Hospital for a skin rash. On March 22nd she was given a box of grey powders at the hospital; she gave the boy the box to carry, and, before she could stop him, he swallowed two of the powders in the street. When she got home she placed the box on the mantelpiece; after the boy's death (two days later) she could not find the box and powders. Sir Bernard Spilsbury said the prescription for the powders contained mercury; he did not think two powders would have a serious effect on the boy, but if the boy took more it might have had a fatal result. After an adjournment of the inquest for the purpose of chemical analysis of the internal organs, Dr. G. R. Lynch gave evidence of finding traces of mercury. There was one-twelfth of a grain in the kidneys and he thought mercury poisoning was the cause of death. Two similar deaths from mercury poisoning were on record. A verdict of accidental death was returned. The coroner, Sir Walter Schröder, said very definite instructions were given with the powders at the hospital but, in view of the evidence, he came to the conclusion that the boy had swallowed an excessive number.

Overdose of Ether.

A child nine weeks old died while under an anæsthetic at King's College Hospital. The evidence at the inquest at Camberwell on April 23rd was that the anæsthetic was administered by the assistant casualty officer of the hospital who said that he had been qualified for about a week, and had administered altogether about 120 anæsthetics, about 25 by himself. The child was undergoing a minor operation; 25 minutes after the operation had begun breathing stopped; oxygen was given, artificial respiration was at once tried, and restoratives were injected, but without success. The second casualty officer, who had been qualified for four months, said he was supervising the operation (which he had himself performed almost daily for the last three months), while a dresser conducted it. There was no undue hæmorrhage; the senior casualty officer was called when the case went wrong. Questions were asked by Mr. Douglas Cowburn, the Camberwell coroner, indicating his opinion that the operation took too long, and that a more experienced anæsthetist would have noticed earlier that something was amiss. He explained to the child's mother that death was due to an overdose of ether, though he added that the doctors concerned (who greatly regretted what had occurred) had done everything possible in the endeavour to save its life afterwards. Mr. Cowburn did not, it appears, condemn the practice of permitting dressers to perform simple operations in a teaching hospital, but he described the degree of supervision as unsatisfactory in the sense that the doctors present had so recently been qualified. A verdict of accidental death was recorded.

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ROYAL ARMY MEDICAL CORPS.

MILITIA.

Maj. L. A. B. Moore retires on attaining the age limit.

TERRITORIAL ARMY.

Col. C. R. White to be Hon. Col. R.A.M.C. units, 53rd (Welsh) Div.

Maj. W. T. Briscoe resigns his commn. and retains his rank, with permission to wear the prescribed uniform.

Maj. A. F. Hewat resigns his commn.

Capt. G. Sparrow (late R.A.F.) to be Capt.

Lt. E. A. Wilson to be Capt.

2nd Lt. C. R. L'E. Orme, from Gen. List (T.A.) to be Lt.

R. Anderson to be Lt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Maj. (Bt. Lt.-Col.) C. H. Lindsay resigns his commn. and is granted the rank of Col., with permission to wear the prescribed uniform.

Lt. D. L. Greig from the Active List to be Lt.

INDIAN MEDICAL SERVICE.

Capt. Sankarankoil Chidambaranatha Alagappan to be Maj.

Lt.-Col. W. M. Anderson retires.

Maj.-Gen. W. H. S. Nickerson, late R.A.M.C., has been selected for appointment as Director of Medical Services in India in succession to Maj.-Gen. Sir Walter H. Ogilvie, I.M.S., who will retire in September.

Correspondence.

"Audi alteram partem."

THE EFFECTIVE USE OF RADIUM.

To the Editor of THE LANCET.

SIR,—In your leading article of April 27th you state that "in this country there is no centre where the method (the use of large quantities of radium at a distance from the body) is being used." It would be a pity if the files of THE LANCET carried down to history a wrong impression of the progress of radium work in this country in the year 1929. It is in use at Westminster Hospital. It is impossible to work for long with needles, radon seeds, cavitaries and surface appliances and remain satisfied. It is not enough to deal with localised primary growths and glandular metastases. The greater the encouragement gained from dealing with these, the stronger the compulsion to attempt control of extending primary growths and visceral metastases. No X radiation is yet available with frequency of high gamma-ray order. One must, therefore, test gamma-radiation ("teletherapy") as soon as a quantity of radium is available that makes it at all possible.

At Westminster last December a gramme of radium became available. An apparatus was designed for us (by F. R. Carling) suitable for the space at our disposal, and adequate for us to gain experience. A 24-hour service was necessitated almost from the first. Already it has been of great use to us. It is much too early to speak of results—good or bad; but we have learned (1) the desirable features to be embodied in the design of our more permanent apparatus; (2) something of the effects upon the blood, metabolism, general well-being and morale of advanced cases; (3) that our fears for the skin were exaggerated; (4) that we must modify our ideas of the mode of action of radium. We were aware, of course, for physical and mathematical reasons, that it would be desirable to have two or two and a half grammes in the apparatus. We hope to be entrusted with such a quantity, but we do not now think that the four grammes employed on the Continent is really necessary. Although we badly want more needles and more radon, we are satisfied that concentration of half our available radium in one apparatus has been amply justified.

No doubt you will agree that premature publication of results would be an error, but we welcome visits from all who are really interested in the subject, and in fact, a good many visitors from radium centres have already so honoured us.

I am, Sir, yours faithfully,
E. ROCK CARLING.

Westminster Hospital, S.W., April 26th, 1929.

To the Editor of THE LANCET.

SIR,—I have read with interest your leading article with this heading last week, but I cannot help doubting whether your arguments are sound. It seems to be your belief, in agreement with Dr. G. E. Birkett's letter, that the ideal to be aimed at in radium treatment is likely to be found in the so-called "bomb," giving a beam-irradiation from a distance. This may be true, and the method must assuredly be exploited, but it is clear that for many years to come its application on a large scale will be quite impracticable, for even a State-organised radium supply will not be adequate. It is our duty, therefore, to progress as far as natural limitations permit with the development of the "surgery of access" and the implantation of needles or seeds.

You state, however, that it is *obviously* impossible to obtain uniformity of irradiation of a tumour by any such method. To me this is not obvious at all. In fact, with so accessible a tumour as a carcinoma of the breast it is, in practice, [illegible] easy. Furthermore, a uniform irradiation can also be given to a larger area of lymphatic drainage than can be dealt with by operative surgery. You are pleased to regard my attitude as "courageous" (an epithet which so often carries a hidden implication of "foolhardy"), but I wish to suggest that the method practised at St. Bartholomew's and at several other hospitals is certainly no more, possibly rather less, courageous than the numerous operations performed daily throughout the country in which cancer-bearing lymphatics may be cut across and the disease further disseminated. Radium, with its selective action on malignant cells, is more precise and much more delicate than the scalpel, and its influence can be carried further. Clearly, if the disease has already been disseminated to other parts of the body, radium implantation can be no more curative than operation, even though it be gentler in its action. But can, in this event, even a radium-bomb be expected to work the miracle? The disease may be demonstrable *simultaneously* in mediastinum and cervical and lumbar spine, and it is difficult to believe that any method of treatment can be curative other than some therapeutic agent introduced into the circulation.

I fully agree with you that it is "rather much to expect that any implantation of radium tubes can cope satisfactorily with advanced disease." I am not aware, however, that any such claim has ever been made. The introduction of radium treatment has not, and probably never will, invalidate the principle so often inculcated by Lord Moynihan and others that successful treatment depends primarily on early diagnosis. Meanwhile, as recently stated in your columns by Mr. H. S. Souttar, work in this particular field in the continental radiological clinics is almost at a standstill. The radium-bombs are at work, but the treatment of carcinoma of the breast has not progressed, and I doubt whether any other radiological method has ever produced a series of results to parallel those obtained with radium needles by the Surgical Unit and myself at St. Bartholomew's. This may sound immodest, but I believe it is true.

Let us by all means look forward to the day when radium in large quantity shall be available everywhere, but in the meantime no useful purpose is served by depreciating present efforts.

I am, Sir, yours faithfully,
GEOFFREY KEYNES.

Park-square West, April 26th, 1929.

To the Editor of THE LANCET.

SIR,—May I, in a few words, support the timely leading article in your last issue and Dr. G. E. Birkett's letter on which it was based? It is a serious misconception, which has captured a considerable section of medical and lay opinion, that the "surgery of access" is a broad and relatively easy way towards the practical solution of the cancer problem. But the burying of radium tubes is faced, as a method, with difficulties such as you have pointed out, and with a double risk in addition, that of causing or aggravating sepsis, and that of setting free cancer cells by the manipulations involved, and so giving rise to metastasis. Regaud has given it as his opinion that where a malignant tumour can be adequately attacked by external radiation, that method should be preferred to surgical implantation.

Your article asks if deep-seated tumours can be adequately treated by external radium. I have shown this in breast cases,[1] and a few weeks ago in New York I heard from Prof. James Ewing of two cases of cancer of the stomach (operated on, found to be inoperable, and proved malignant) at the Memorial Hospital which show neither clinical nor radiological signs of disease after the 4-gramme "radium-bomb" treatment there. No other known method of treatment can show even such temporary results—for these are recent cases, and by no means to be classed as "cures" yet—but such encouraging omens show the great without success. The second casualty officer, who had been qualified for four months, said he was supervising the operation (which he had himself performed almost daily for the last three months), while a dresser conducted it. There was no undue hæmorrhage; the senior casualty officer was called when the case went wrong. Questions were asked by Mr. Douglas Cowburn, the Camberwell coroner, indicating his opinion that the operation took too long, and that a more experienced anæsthetist would have noticed earlier that something was amiss. He explained to the child's mother that death was due to an overdose of ether, though he added that the doctors concerned (who greatly regretted what had occurred) had done everything possible in the endeavour to save its life afterwards. Mr. Cowburn did not, it appears, condemn the practice of permitting dressers to perform simple operations in a teaching hospital, but he described the degree of supervision as unsatisfactory in the sense that the doctors present had so recently been qualified. A verdict of accidental death was recorded.

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[1] THE LANCET, 1926, i., 431; and 1928, ii., 63.

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Maj. L. A. B. Moore retires on attaining the age limit.

TERRITORIAL ARMY.

Col. C. R. White to be Hon. Col. R.A.M.C. units, 53rd (Welsh) Div.

Maj. W. T. Briscoe resigns his commn. and retains his rank, with permission to wear the prescribed uniform.

Maj. A. F. Hewat resigns his commn.

Capt. G. Sparrow (late R.A.F.) to be Capt.

Lt. E. A. Wilson to be Capt.

2nd Lt. C. R. L'E. Orme, from Gen. List (T.A.) to be Lt.

R. Anderson to be Lt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Maj. (Bt. Lt.-Col.) C. H. Lindsay resigns his commn. and is granted the rank of Col., with permission to wear the prescribed uniform.

Lt. D. L. Greig from the Active List to be Lt.

INDIAN MEDICAL SERVICE.

Capt. Sankarankoil Chidambaranatha Alagappan to be Maj.

Lt.-Col. W. M. Anderson retires.

Maj.-Gen. W. H. S. Nickerson, late R.A.M.C., has been selected for appointment as Director of Medical Services in India in succession to Maj.-Gen. Sir Walter H. Ogilvie, I.M.S., who will retire in September.

general condition deteriorates, as shown by increasing hypotension and a persistence of the ketosis. I have obtained an almost miraculous recovery in such a case by a suitable dose of insulin, followed in one hour by the intravenous injection of 600 c.cm. of gum saline containing 30 g. of glucose.

I am, Sir, yours faithfully,
H. E. MANSELL, M.R.C.S.
Hastings, April 29th, 1929.

THE INJECTION TREATMENT OF VARICOSE VEINS.

To the Editor of THE LANCET.

SIR,—Prof. Archibald Young's letter in your issue of March 2nd (which has just reached me) must surprise a large part of the medical world. The annotation to which he takes exception to my mind undoubtedly reflects what the vast majority of us who have treated varicose veins by injection feel about this new treatment. Referring to the annotation, Prof. Young says "This is a general statement that should hardly be made without a simultaneous presentation of the proofs upon which it is based." If he had been present as I was at the conference at the Royal Society of Medicine in London last year, when the late Prof. Sicard of Paris and his assistants reported more than 300,000 injections given without a fatality, or even a severe complication, I think he would not condemn a line of treatment which, on his showing, he has not even attempted to try. The injection treatment of varicose veins has come to stay. It is a safe treatment which all medical men can carry out in their consulting rooms with the best possible results if the cases are properly selected. The avowed purpose of the method is not obliteration of the lumen of the vein by the production of thrombosis. Obliteration will not occur unless the injected fluid comes into free contact with the vein wall, giving rise to local irritation which causes the intima to swell and proliferate all round (with or without an actual thrombus), glueing the walls of the vein together. In this part of the world we have been using sclerosing injections for six years or more with no untoward consequences. It is economical for the patient, both in time and money. It is far safer than an operation; the patients are delighted, and the medical men are satisfied. I personally sclerosed my own veins last year with the fullest confidence.

I am, Sir, yours faithfully,
S. M. WELLS, F.R.C.S. Edin.
Valparaiso, Chile, South America, March 27th, 1929.

OPEN-AIR TREATMENT OF SUBNORMAL CHILDREN.

To the Editor of THE LANCET.

SIR,—Dr. Elizabeth Miller's interesting article in your issue of April 20th on the experiment which the Huddersfield Education Authority has undertaken in the open-air treatment of "subnormal" children, prompts me to inquire what percentage of the children selected for such treatment are suffering from actual tuberculous toxæmia, and not merely from debility due to poor home environment and hygiene. It is stated that the children selected suffer mostly from anæmia, malnutrition, deficient muscular tone, and lassitude; but are not such symptoms typical of early tuberculous infection—so often miscalled the "pre-tuberculous" phase—which would naturally respond to the regimen outlined in her article? It would be interesting to know whether these children are subjected to tuberculin tests.

In Southfield Sanatorium Colony under the Royal Victoria Tuberculosis Trust numbers of such "subnormal" children are treated along sanatorium lines, and the results amply justify the claims made by Dr. Miller, the improvement in the child's condition being almost invariably rapid and dramatic. The great majority of such children, however, give a positive tuberculin reaction, and are regarded as definitely suffering from the effects of tuberculous infection.

It is possible, therefore, that the Huddersfield Education Authority has—perhaps unwittingly—been among the first of public bodies to establish the system whereby the problem of tuberculosis may be thoroughly successfully tackled, through increasing the resistance of the "subnormal" child, who is really tuberculised, long before relatively intractable gross glandular or pulmonary lesions have manifested themselves.

I am, Sir, yours faithfully,
D. MELVILLE DUNLOP, M.D.
Southfield Sanatorium Colony, Edinburgh,
April 29th, 1929.

SOLAR DERMATITIS.

To the Editor of THE LANCET.

SIR,—In the leading article on Solar Dermatitis, which appeared in your issue of April 27th, you quote Vallery-Radot's observations on the effect of the mercury-vapour lamp on sun-sensitive persons. The rays emitted by the K.B.B. mercury-vapour lamp vary in wave-length approximately from 2,000 to 5790 Angström units, and it is these rays and not the more slowly vibrating rays of the visible spectrum which are supposed to produce the reactionary erythema and pigmentation of the skin.

But evidence is increasing that the reaction which we call solar dermatitis, occurring in sun-sensitive persons, is not due to the ultra-violet rays, but to rays nearer to the yellow and red rays of the visible spectrum. These are the photosynthetic rays which are employed by the green leaf in converting carbonic acid into carbohydrate. Their dynamic character is constructive in opposition to the ultra-violet rays which are essentially destructive.

In persons liable to solar dermatitis some chemical substance is present in the skin, which substance is activated, or increased in quantity by some of the visible rays of the solar spectrum. This substance, the nature of which is at present unknown, is apparently destroyed by the ultra-violet light.

The following case shows that while improvement may follow ultra-violet radiation the "cure" is only temporary.

Mrs. A. B., aged 60, came under my care for solar dermatitis in May, 1927. The sun-sensitiveness was of recent origin, her first attack being in the summer of the previous year. The parts affected were the face, the backs of the hands, fingers, and wrist, and slightly the fronts of the legs. The lesions were erythematous and urticarial. A 24-hour specimen of urine showed a definite excess of urobilin but no hæmatoporphyrin. The colour of the iris was blue-grey, with brown pigment interspersed at the outer margin. The complexion was sallow. She was 33 days under observation, during which she had 16 exposures to the mercury-vapour lamp. The first ten exposures were at 30 inches from the burner, the shortest interval being 28 inches. The duration of exposure varied from two to five minutes. The temperature of the room was about 21° C. (approximately 70° F.). The face, neck, trunk, upper and lower limbs were exposed to the rays, but no area was re-exposed on two consecutive days. By the 16th day of treatment there was marked improvement in the face and diminution of sensitiveness, for even when the patient had sat in the garden for several hours no solar reaction ensued, except slight swelling of the hands.

On conclusion of the course of treatment the patient obtained relief for a few weeks. I have not seen her since July, 1927, but in a recent letter she informs me that during the following summer she suffered from the same complaint, and again during the present spring.—I am, Sir, yours faithfully,

H. LESLIE-ROBERTS, M.D.
Liverpool, April 30th, 1929.

STUDENTS' BEDS AT BIRMINGHAM.—Two beds endowed out of the amount allocated from the money raised by students of Birmingham University at their last carnival were last week unveiled at the Queen's Hospital.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

LOCAL GOVERNMENT (SCOTLAND) BILL.

IN the House of Lords on April 24th, on the motion for the third reading of the Local Government (Scotland) Bill,

Lord **ARNOLD** said this Bill had aroused intense opposition in Scotland. It would lead to administrative chaos, and before long amending legislation would be necessary. The Marquess of **SALISBURY** (Lord Privy Seal) said that the opposition to the Bill was not so great as Lord Arnold had suggested, and as a result of the concessions which had been made by the Government the opposition had become inconsiderable. The Bill was read the third time.

On April 26th the House of Commons considered the Lords' amendments to the Local Government (Scotland) Bill. All the amendments were agreed to with the exception of the amendment providing that on a vacancy arising in the office of medical officer of health or sanitary inspector of a small burgh the corresponding officer of the county should ipso facto become the officer for that burgh. This amendment was disagreed with.

SCHOOL MEDICAL SERVICES.

In the House of Commons on Tuesday, April 23rd, Lord **EUSTACE PERCY** (President of the Board of Education), speaking on the Vote for the salaries and expense of the Board of Education, said that to complete a balanced scheme of education they must give a more natural and normal place in the structure to two types of school which had hitherto stood rather outside our elementary school system—the special school and the nursery school. As regarded the special school, a recent report of the Committee appointed by Sir George Newman had indicated certain defects in the methods of dealing with mentally deficient children. He (Lord Eustace Percy) had always felt these defects very strongly. He had been somewhat criticised for waiting for this report before deciding upon his policy in regard to schools for mental defectives, but he believed that the Committee's work would enable them to make a more comprehensive and varied provision for the needs of such children within the general school system than had been possible on the basis of a procedure of medical certification, which had tended to divide retarded children into two fixed and somewhat artificial categories. The nursery school presented a very different problem, but it was also a subject on which they all needed to clarify their views by thorough investigation. He frankly admitted that he had left this problem in the stage at which he had found it—that of isolated experiments. Those experiments had not been unfruitful. They had, for instance, led the Board to modify its views on certain points, such as the size of nursery schools, but they could not be content either with the present rate of progress or with any of the proposals which had recently been put forward on this subject, which seemed to him to amount to little more than a multiplication of isolated experiments. The time had come when this, their one remaining administrative problem, should be brought into the focus of a settled policy and, as recently announced, the Board of Education proposed to conduct a comprehensive inquiry with that object.

Scottish Education Estimates.

The Education Estimates for Scotland were subsequently discussed.

Mr. D. M. **COWAN** expressed satisfaction that recently an educational research committee had been set up in Scotland. That committee, he said, received its income in equal parts from the teaching profession and the school authorities, and last year it had at its disposal something like £1500. The committee was composed of representatives from the two bodies named, from the universities, the technical colleges, and the medical profession. Scotland in this matter of research had been perhaps rather backward for a long time; she was, perhaps, living somewhat on her tradition, and it was therefore all to the good that she had now this enthusiastic body devoting itself to the study of educational methods and the child mind. The object of the committee would be not only to provide a good educational course for the normal child, but to find out how the backward child could be specially dealt with. It would be impossible for the Scottish Education Department to become a direct party to the Research Committee, because it might be thought in that event that they were bound by the findings of the committee.

Nutrition of School-children.

Mr. **JOHNSTON** said that in the report of the Scottish Education Department it was admitted that the nutrition of over 6 per cent. of the school-children examined by the school medical officers was below the average. That was due to hunger. What did the department intend to do to see that this 6 per cent. were sufficiently fed at school? Within the last ten years things had gone back in this respect. Ten years ago the onus was indirectly on the education authority, but now the education authority only stepped in when private charity had failed. Even then they might make arrangements with the poor-law authorities, so that it was only in the last resort that the education authorities intervened to see that a child was in a physical condition to receive the education provided. The average cost of a school-child was 22s. per week, and he asked why they should not spend the extra two or three shillings which would ensure that the amount spent on education was wisely spent? If they did not attend to a child's physical condition in its school years they would have to pay for it afterwards in the cost of sanatoria, hospitals, and other public institutions. He urged that the 6 per cent. of school-children who were under-nourished should be immediately looked after by the authorities. The question of medical inspection of school-children was very briefly dealt with in the report of the department. Even in such reference as was made they were referred to the tenth annual report of the Scottish Board of Health, and on turning to that report they found that 73 per cent. of the children attending schools suffered from defective teeth. The dental services were inadequate. Then there was rickets—a poverty disease—and defective eyesight, which amounted to 5 per cent. and was still growing. All these facts did not seem to merit any encomiums on the work of the Education Department so far as the health of the school-children was concerned. Sir George Newman in a book recently published by the Health Department, showed, distinctly and clearly, how, for an almost infinitesimal public expenditure, and by taking the right kind of diseases first, they could wipe away great blocks of pain and disease in the public life of the nation. Yet the department were actually going backwards so far as the feeding of school-children was concerned. Many of the schools were designed and built many years ago, and in his (Mr. Johnston's) opinion, a very large amount of the children's troubles arose directly from bad heating arrangements and bad ventilation. Until those arrangements were changed they were not likely to wipe out a considerable proportion of children's troubles.

Reply to the Debate.

Major **ELLIOT** (Under Secretary for Scotland), replying to the debate, said that the school accommodation in Scotland had been considerably enlarged in the past few years. With regard to clinics, it was obviously a mistake to mix up sound and sick school-children and defective children with normal children, and to create an educational institution with clinical facilities of one kind and another. There was every reason to believe that with the unification of the activities of the local authorities it would not be necessary to overcrowd the educational institutions with school clinics, while a street or two away, or it might be only across the street, there were facilities for carrying out these medical examinations in buildings designed for the purpose, where it could be done without trenching on the all too inadequate provision available to teachers for carrying out the main purposes of the school. Everybody agreed that it was a desirable thing to unify and amalgamate the health services. The break between the school health services and those of the local authority was undoubtedly one of the blots on our educational system which the Local Government (Scotland) Bill would remove. He was sure there would be a very great improvement as the result of the working of that Bill. He would report to the Secretary of State for Scotland that the Committee in its discussion that night considered that greater attention should be paid to the physical condition of school-children.

The debate on the Vote was adjourned.

COLONIAL MEDICAL SERVICES.

On Tuesday, April 30th, the House of Commons went into Committee on the Civil Service Estimates, Mr. D. **HERBERT** in the chair.

On a vote for the salary and expenses of the Colonial Office, Mr. **AMERY** (Secretary of State for the Dominions), speaking of colonial research work, said that important as animal and plant health were, human health was of even greater importance, and the Colonial Office was not only an administrative office, but very essentially a Ministry of Health for the tropical world. In that matter there had been a great stir on the face of the waters throughout the Colonial Empire. In every direction governors and administrators had shown the greatest enthusiasm, often splendidly supported by their wives, in the matter of maternity and child welfare and in improving the health conditions of the people. Everywhere the position was improving. For instance, the creation of the large electric power scheme, which was carried out in a malarial jungle, had involved no appreciable sickness among the body of 4000 workers, a condition of affairs that would have been incredible a few years ago.

Dr. **Vernon Davies**: Thanks to the medical profession.

Mr. **Amery** said that in every direction educational institutions had been increased. To-day the great hospitals on the Gold Coast and at Singapore were unrivalled in the tropical world. Ceylon had 100 hospitals and something like 8000 beds. Malaya had 25 travelling motor dispensaries and two motor-boats, which, in a year, treated 150,000 cases. There was a Medical College at Singapore, an institution calculated to be of immense importance to the whole of the Eastern colonies, and it was hoped shortly to establish something of the same sort in West Africa. In many of these departments of research they were greatly indebted to the Rockefeller Foundation for the assistance which they had given. At headquarters greater attention in these matters had been reflected in the change in organisation. In 1926 an adviser on medical questions was appointed at the Colonial Office and the appointment had now been made permanent. There was a Colonial Advisory Committee on medical and sanitary questions, and in 1927 there was added a special Colonial Medical Research Committee, and they had also received the coöperation of such institutions as the London and Liverpool Schools of Tropical Medicine. Not the least important matter in this connexion was the training of native medical staffs. They hoped to increase that work which had grown to a remarkable extent in the last five years all over West Africa, and to build up an increasingly high degree of medical training so as to enable the natives to qualify for the actual conduct of the treatment of these cases. No less essential was the development of education in questions of hygiene among the general mass of the population.

Mr. **Amery** gave the names of the Committee which he had appointed to consider the existing system of promotion in the Colonial Office and public services of Dependencies not possessing responsible government. The Committee would include Dr. **Drummond Shiels**, M.P.

The vote was agreed to.

THE LONDON LOCK HOSPITAL.

On the motion for the adjournment,

Mr **Pethick-Lawrence** called attention to the management of the London Lock Hospital. He said that the Minister of Health had admitted in reply to questions that the Report of the Committee of the Inquiry showed that very considerable changes in the management of the hospital were desirable. The right hon. gentleman, however, had refused to publish the Committee's report and had stated that the Board of the Hospital were making very considerable changes. In his (Mr. Pethick-Lawrence's) view, reforms at the Hospital could not be carried out except by a reconstituted Board of Management and a change in the personnel of the Hospital staff. It was 10 years since the action of the Board was first called in question, and the first body of responsible women found it necesssary to resign because their protests remained unanswered. All that time the Board had made no important changes. The promises of the Board were not good enough. Apart from the changes in the management and personnel to which he had referred it was also necessary that the report of the Committee of Inquiry should be published so that public confidence might be restored.

Mr. **Chamberlain** (Minister of Health) said that he wished to remind the House of his position in this matter. This was a voluntary hospital. It was not an institution over which he had any authority by law, and he only came into the matter because in consequence of certain publicity which had been given to the charges made against the Board, the Board requested him, as an impartial and independent person, to appoint a small Committee to inquire into the charges. In asking for that inquiry, the Board made it a condition that it should be a private inquiry, that the evidence should be treated as private; and it was on that condition that the Committee was appointed and evidence was given before it. It was quite clear, therefore, that in no circumstances could the evidence given to the Committee be published. He had no personal knowledge of the circumstances which led to the charges which had been alluded to; his concern was rather that of a person who desired to see that the interest of the public in London were protected. This Hospital, which was the only one of its kind in London could, if properly conducted, perform a great service and one which no other institution was capable of performing. He was not concerned to defend the members of the Board, nor to pursue any vendetta against them. Some of the delay which had taken place was due to the fact that the Chairman of the Board had been in very bad health, and had not been able to give continuous attention to the matter, which required concentrated attention. A Board, faced with recommendations which involved a number of suggestions for the alteration of the management and of the whole system on which the Hospital was run could hardly be expected to f[illegible] proposals to carry out those recommendations in the course of one or two meetings. It was only reasonable that they should take adequate time to examine thoroughly all possible alternatives and try to find a solution of what must have been a very difficult and embarrassing situation for them. If he felt that the Board was not facing up to the situation and was disposed to go on as it had before, and to take no serious account of the important suggestions which had been made in the report, he would not have hesitated to publish the report as a means of bringing pressure upon them through public opinion. But he had felt all along that that was a course which he ought not to take unless he felt convinced that it was really necessary to bring about the results desired. The report, after all, did not charge the members of the Board with any moral obliquity, any dishonesty, or any financial irregularity; but it certainly did indicate that the administration of the Board, in parts, might well be improved. The publication of the report would draw public attention to the Hospital in a way which could hardly fail to have a serious effect upon the working of the Hospital itself. The first result must inevitably be a reduction in the public contributions to the Hospital, which had already suffered to some extent. The public discussion of the report would present difficulties to the Board in obtaining the services of the staff—not merely of the medical staff, but particularly of the nursing staff. He had very good reason to suppose that the reconstitution of the Board did form a part of the proposals which he expected to have in his possession before very long. He had in contemplation some further steps which he did not feel at liberty to discuss in public, but which might well further assist towards a satisfactory solution. He still reserved to himself the right to take a decision and publish the report if he was not satisfied with the administration of the Hospital.

HOUSE OF LORDS.

THURSDAY, APRIL 25TH.

Road Vehicles Bill.

Viscount **Cecil of Chelwood**, in moving that the House go into Committee on the Road Vehicles Regulation Bill, said that although the Select Committee which had considered the Bill recommended that it be not proceeded with, he thought that with amendments, which he was prepared to move, he would be able to convince their lordships that the Bill was entitled to further examination by them. The reason given by the majority of the Select Committee for coming to the conclusion that the Bill should not be proceeded with was that it had little chance of success. He thought that the fact that the Parliamentary chances of the Bill were remote ought not to make any difference to their lordships in dealing with the measure. The position as regarded road accidents had become even more serious than it was last autumn when he raised the matter before their lordships. The fatal accidents last year had increased 20 per cent., and this was not accounted for by the increase in the number of cars on the road, which only amounted to 5 per cent. The non-fatal accidents had also increased to a very large extent. The evil was one which urgently called for attention, and if the proposals in the Bill would do anything to mitigate that evil, whether they passed into law or not, it was the duty of their lordships to pass them.

Lord **Sandhurst**, in moving the rejection of the Bill, said that the Select Committee, of which he was a member, was impressed with the belief that had they tried to amend the redrafted Bill they would have failed to present anything like an uncontroversial measure that might have had a chance of passing into law during the present session.

Lord **Buckmaster** supported Lord Cecil's motion.

Earl **Russell** said that it would be of no use to carry the Bill any further as it was not susceptible of useful amendment.

Lord **Danesfort** said he thought that the Bill with amendments which their lordships might make would be extremely valuable.

The Earl of **Birkenhead** said everyone acquainted with the present state of Parliamentary business knew that this Bill had not the slightest chance of becoming law in the present Parliament.

The Marquess of **Londonderry** (First Commissioner of Works) said that the Government had opposed the Bill on the second reading on two very serious grounds. First of all they considered that the proposals were hardly of the character called for by the present traffic situation. Their second main objection was that the Royal Commission on Transport, presided over by Sir Arthur Griffith-Boscawen, was already examining the questions dealt with by the Bill, and it would obviously be premature and undesirable to proceed with legislation pending the report of that Commission. The Government fully recognised, however, the [illegible]cy of the problem of road traffic regulation and were not careless of the loss of life, which was the truly deplorable feature of present-day road traffic; but it must also be recognised that the problem was one of immense complexity. He could assure Lord Cecil that though the Bill might be dropped his efforts to arose the public to a sense of the urgency of this question had not been in vain. If the present Government were returned to power after the General Election they would produce a Bill dealing with the matters concerned in Lord Cecil's measure, fortified and strengthened as they would then be by the consideration of the recommendations of the Royal Commission. He asked Lord Cecil not to press further consideration of the Bill.

Viscount CECIL said that he could not feel that he would be doing any good by consenting to the withdrawal of the Bill.

Viscount CECIL's motion to go into Committee was defeated by 49 votes to 6.

Battersea Power Station.

Lord JESSEL called attention to the menace to the health and amenities of London by the erection of the Battersea Power Station and moved for papers. He said the proposed station would be close to Battersea Bridge and within 300 yards of Westminster. It would be the second largest in this country. It was expected to consume some 800,000 tons of coal. The noble lord drew attention to a letter which had appeared in the *Times* signed by very important and influential people. That letter drew attention to the corroding nature of the sulphurous fumes from the station, and added that as the prevailing wind in London was from the south-west the normal flow of fumes from the Battersea station would take a line over the Tate Gallery, Lambeth Palace, St. Thomas's Hospital, the Houses of Parliament, and other important buildings. The letter went on to say that it was doubtful whether any proper provision could be made to secure the prevention of sulphurous fumes in the atmosphere. He hoped that the Government would make a move in the matter in order to prevent the erection of the station. If they did not do so, no doubt the public bodies who were opposed to the project would apply for an injunction. The only promise they had so far obtained from the Government was that the Government chemist should be the arbitrator as to whether proper precautions had been taken or not.

After further discussion,

The Marquess of LONDONDERRY said that the Office of Works were very keenly alive to the suggestions that had been made by Lord Jessel and in the Press signed by very influential names. He could assure the noble lord that with the advantages at their disposal and the experts that they had the privilege of consulting it was not likely that they were proposing to hand over any of their responsibilities or not to discharge them to the best of their ability. The health of the population was a very important matter, and Lord Jessel could be satisfied that a project of this kind would not be allowed to go forward unless the Minister of Health was satisfied that there was no danger. As a result of scientific research smoke and grit need no longer be a nuisance to the public. The erection of this station would eliminate three other stations, and the reduction of sulphur fumes due to coal fires was calculated to be no less than 30 per cent. By electricity being made available to the population in London the consumption of coal in a great number of houses would also be reduced. Only one-third of the full scheme has been at present authorised, and he would give an assurance to Lord Jessel that the further extension of the generating station to the remaining two-thirds would not be undertaken unless it was clearly understood and agreed by the authorities that there was no danger from the health point of view, or from the destructive point of view, which did in the minds of many people follow as an effect of sulphur fumes. The matter was engaging the full attention of the Minister of Health, the Minister of Transport, and himself as First Commissioner of Works. Unless they were satisfied on the advice of the Government chemist and of the Department of Scientific and Industrial Research that there was no danger the full scheme would not be completed.

Lord JESSEL said he thought the safeguards given by Lord Londonderry were much more ample than those given by the Minister of Transport in the House of Commons. He was grateful for the assurances.

After further discussion, Lord JESSEL withdrew his motion for papers.

TUESDAY, APRIL 30TH.

Pharmacy Bill.

Lord DESBOROUGH, in moving the second reading of the Pharmacy Bill, explained that it was designed to secure reciprocity in regard to the registration of qualified pharmacists between Great Britain and Northern Ireland.

The Bill was read a second time.

Age of Marriages Bill.

Lord BUCKMASTER, in moving that the House go into Committee on the Age of Marriages Bill, said that the measure had been referred to a Select Committee who had unanimously reported in favour of a change in the legal age of marriage rendering a marriage void between persons either of whom was under the age of 16. He said that if the House agreed to his motion he would move amendments providing that if a man was charged with having unlawful connexion with a girl under 16 it should be a defence if he could show that when he married the girl he had reason to believe that she was 16 years of age; and also that in the case of a marriage being declared void under the Act, it should be lawful for the woman to apply for maintenance for a child born after the marriage, such child then becoming illegitimate within 12 months of the marriage being declared void.

The Marquess of SALISBURY (Lord Privy Seal) said that the Government were in favour of the Bill and were anxious that it should become law. He wished to point out, however, that at this stage of the Session it was impossible to pass the measure unless by general consent. The Government had no objection to the insertion of the amendments referred to by Lord Buckmaster, subject to redrafting on the Report stage.

Lord BUCKMASTER's motion was agreed to.

The amendments were agreed to and the Bill passed through Committee and was reported to the House.

HOUSE OF COMMONS.

WEDNESDAY, APRIL 24TH.

New Treatment for Epilepsy.

Sir BERTRAM FALLE asked the Minister of Health if he could give any information as to a new treatment of epilepsy by Prof. Fitzsimons, of Port Elizabeth, which had now been tried for a considerable period; and the results, if any, of the treatment.—Mr. CHAMBERLAIN replied: I understand that this is a treatment with a preparation from the venom of the Puff adder and the Cape cobra. I have no exact information of the results of the treatment, but according to an article in the *Journal* of the Medical Association of South Africa of Nov. 24th, 1928, p. 598, there is no reason to believe that the results are superior to those obtained by the use of the more common remedies.

Woman's Death at Sudbury.

Sir CHARLES OMAN asked the Minister of Health whether he had received any information as to the recent inquest at Sudbury where the doctor who gave evidence in the case stated that it was one of starvation; what were the circumstances; whether the deceased applied for medical or other out-relief; whether any of the officers of the guardians or the guardians were cognisant of the deceased being in need; if so, whether and when the officer or the guardians offered such relief: and, if not, why not.—Mr. CHAMBERLAIN replied: I have received a newspaper report of this inquest and a copy of a report made by the relieving officer to the clerk to the Sudbury Guardians. The deceased was 76 years of age. She was in receipt of an old age pension of 10*s.* a week and a weekly parcel of food, value 5*s.*, from a charitable fund. At the date of her death 14*s.* 2*d.* in cash and an adequate supply of fuel and food was found in the house. The deceased was a very independent old lady and would not let anybody do anything for her. The jury's verdict was that death was due to heart failure accelerated by the cold weather, following starvation and self-neglect. The deceased had been an inmate of the Sudbury Poor-law Institution, but was discharged at her own request on April 24th, 1927, and no application for relief had been made by her since that date. As regards the remaining parts of the question, it will be seen from the information given above that the deceased was not lacking in food, fuel, or shelter. I concur in the view reported to have been expressed by the coroner at the inquest, that it did not appear that anyone could be called in question for having neglected the deceased.

Smoke Abatement By-laws.

Sir ROBERT THOMAS asked the Minister of Health the number of by-laws made, and the number applied for, under Section 2 (1) of the Public Health (Smoke Abatement) Act, 1926; the number of by-laws made or applied for under Section 5; the number of local authorities combining for the purposes of the Act as under Section 6; and the extent to which local authorities had made use of the powers to conduct researches as under Section 10.—Mr. CHAMBERLAIN replied: Fifty-one by-laws have been made and confirmed by the Minister under Section 2 (1) of the Public Health (Smoke Abatement) Act, 1926, and 37 more are under consideration; no application has been received for the confirmation of any by-laws under Section 5. One committee has been formed, so far as I am aware, with administrative powers under Section 6, representing two authorities; five regional advisory committees have been formed representing some 300 authorities. As regards the last part of the question, I have no exact information, but I am informed that 40 local authorities are coöperating in systematic observations of the extent of atmospheric pollution, and 33 authorities are contributing to the cost of the central services of the Department of Scientific and Industrial Research for supervising and coördinating the observations and towards research for improving the methods of making these observations.

Thursday, April 25th.

Empire Cancer Campaign and Radium Appeal.

Lieut.-Colonel Fremantle asked the Minister of Health whether the *British Empire Cancer Campaign* was consulted before the Government decided its action with regard to the proposed radium appeal; and whether the campaign, as the principal association for the promotion of cancer research, would be asked to undertake the appeal to the public for funds.—Mr. Chamberlain replied: The answer to both questions is in the negative. While I appreciate the work being done by the British Empire Cancer Campaign in regard to cancer, I should hesitate to accept the estimation of its position in regard to cancer research contained in my hon. and gallant friend's question.

Children in Poor-law Institution.

Mr. Bellamy asked the Minister of Health whether he was aware that there were 10 young children maintained in the Market Bosworth Poor-law Institution, and that there was no proper accommodation for these children, and that they could not be separated from adult and weak-minded inmates; whether he would state the longest period during which any one of these children had been detained in this institution; and whether he would make representations to the board of guardians on the matter.—Mr. Chamberlain replied: I am already in correspondence with the guardians of the Market Bosworth Union concerning their failure to comply with the requirement of Article 4 of the Poor-law Institutions Order, 1913, that children between the ages of 3 and 6 shall not be retained in the institution for a period exceeding six weeks, except on medical grounds. The number of children so detained is at present eight.

Home Treatment of Panel Patients.

Mr. Thurtle asked the Minister of Health if he was aware that, at the inquest proceedings recently on the death of a Shoreditch man named Daniel Fitter, the coroner who presided commented on the inadequacy of the home treatment of this panel patient and of panel patients in general; and if he would inquire into the home treatment given to insured persons.—Mr. Chamberlain replied: I have seen Press reports of this case. Insurance practitioners are required by their terms of service to visit and treat patients whose condition so requires at any place within the districts in which the practitioners have undertaken to visit patients; and any complaint that a practitioner has failed to visit a patient when necessary should be made in the first instance to the local insurance committee, who must have it investigated. I do not think the present case affords sufficient reason for a general inquiry such as the hon. Member suggests.

Small-pox on the "Tuscania."

Lieut.-Colonel Fremantle asked the Minister of Health if any cases of small-pox had been notified during the past week from passengers or crew on the steamships *Tuscania* and *Mashobra*, or from contacts with such persons; if any further deaths had occurred during the week; and what was the vaccination history of the fatal cases that had occurred hitherto.—Mr. Chamberlain replied: According to the information at present available, two cases of small-pox have been notified during the past week from the *Tuscania*. No further deaths have occurred and no case of small-pox has been reported from the *Mashobra*. Information as to the vaccinal history of the fatal cases from the *Tuscania* is not yet available.

The Royal Veterinary College.

Viscount Sandon asked the Minister of Agriculture whether he had yet decided on any action to place the Royal Veterinary College on a modern footing.—Mr. Guinness replied: No, Sir. I am unable to come to a decision on this question pending the receipt of the report of the committee, to which reference has previously been made.

The Radium Appeal.

Mr. Robert Morrison asked the Prime Minister what guarantees the Radium Committee had received that the proposed purchase of 20 g. of radium by voluntary and State funds could be effected at a lower price than the existing price for Great Britain of £12,000 per gramme.—Mr. Chamberlain replied: The subcommittee were not in a position to secure any guarantee that 20 g. of radium bought through a single agency would be cheaper than very much smaller amounts bought by numerous purchasers. But the hon. Member will find their reasons for their opinion on the point in paragraphs 71 and 82 of their report.

Vaccination of Visitors to France.

Lieut.-Colonel Fremantle asked the Secretary of State for Foreign Affairs the requirements with regard to vaccination of visitors proceeding from this country to France; whether these requirements were to continue throughout this year and in future; and whether these matters would in future be arranged through the International Committee of Public Hygiene, at Paris, or through the Health Organisation of the League of Nations, at Geneva.—Mr. Locker-Lampson (Under Secretary for Foreign Affairs) replied: The regulations with which travellers proceeding from this country to France now have to comply provide that: (1) all persons in possession of certificates to the effect that they have been vaccinated within the last five years and not more recently than ten days will be allowed to land without hindrance; (2) those without such certificates will be required to fill in a sanitary passport, giving their names and addresses and their destination, so that they may be subject to medical supervision during the next 14 days; (3) there will be no compulsory vaccination on disembarkation. I understand that at Dieppe holders of certificates are also being asked to submit their arms for medical inspection. At Havre the special regulations introduced by the Mayor and announced in the Press are still being enforced. With regard to the second part of the question the length of time which these regulations will remain in force must necessarily depend upon circumstances. With regard to the third part of the question, it is not, in the opinion of His Majesty's Government, possible to leave the details of administration in such matters to an international body. I would, however, draw the hon. Member's attention to the fact that the French Government have acted in the present case in accordance with Article 42 of the International Sanitary Convention signed at Paris on June 21st, 1926.

Deaf and Dumb Children.

Mr. Thomas Williams asked the President of the Board of Education whether his department admitted any special obligation to assist deaf and dumb children after they left school to secure employment; if so, what proportion of such children secured employment immediately, and how many remained unemployed; and would he consider the advisability of inquiring fully into this class of case with a view to ensuring that employment at reasonable wages should be available for all persons suffering from these disabilities.—Captain Wallace (Lord of the Treasury) replied: The function of the Board of Education in the matter is to secure that the education and training of deaf children shall be such as to fit them as far as possible to become independent self-supporting members of the community. The hon. Member will find full information on the training and placement of deaf children in the chapter on the deaf child (Appendix B.) in the report for 1927 of the Board's chief medical officer. I would refer him particularly to Section 13, which deals with the placement of the deaf child in work on leaving school and details the different agencies concerned with placement. My right hon. friend will consider whether it will be advisable to inquire further into this matter.

Monday, April 29th.

Vaccination and Small-pox at Bombay.

Captain Bourne asked the Under Secretary of State for India whether the Government of India proposed to take any steps to prevent unvaccinated persons embarking for Europe from Bombay during the present epidemic of small-pox in that city; and, if so, if he would state the nature of such proposals.—Earl Winterton replied: The Government of India reports that circulars were issued to shipping companies by the Port Health Department, Bombay, advising the vaccination of all passengers and crews of vessels leaving Bombay, except persons recently vaccinated, and it is understood that this advice is being followed. The latest *available figures, those for the week ending April 6th, show* that small-pox has been on the decline in Bombay city since the middle of March, the number of cases having fallen from 142 during the week ending March 16th to 86 during the week ending April 6th.

Dr. Vernon Davies: Are we to understood that vaccination is advisory and not compulsory?

Earl Winterton: At present I understand that the local authorities which deal with the matter have issued circulars to the companies advising vaccination of their passengers.

I cannot without reference remember whether they have power to make vaccination compulsory. If they have such power, and it is advisable to do so, no doubt it will be enforced.

TUESDAY, APRIL 30TH.

Widows and Orphans and Sickness Grants.

Mr. ROBINSON asked the Minister of Pensions the number of applications received from widows and orphans for sickness grants and the number granted and their cost in 12 months to the last convenient date; if any steps were taken to inform these dependents of men who gave their lives for the country that they were eligible for assistance during periods of ill-health; and, if not, if he would arrange that the widows and the guardians of orphan children should be notified by the Ministry that they were eligible for such assistance.—Sir WILLIAM COPE replied: The number of applications received by the Special Grants Committee during the year ended Dec. 31st last was 494 and in 74 of these cases the Committee were able to make grants at a a cost approximately of £430. The provision for sickness grants, as made in 1924, was designed for cases of a very exceptional character and was subject to specific limitations. Any general advertisement of the grant in the manner proposed would only serve to give an erroneous impression of its character and would lead to disappointment.

Small-pox on the "Tuscania."

Sir BASIL PETO asked the Minister of Health whether there was any quarantine station at the port of Liverpool or any quarantine ship; and, if so, why the s.s. *Tuscania* was not placed in quarantine or the passengers transferred to the quarantine ship when it was found that the ship had small-pox patients on board.—Sir KINGSLEY WOOD replied: The answer to the first part of the question is in the negative. As regards the second part, the measures taken later at Liverpool on the arrival of s.s. *Tuscania* were in accordance with the procedure laid down in the International Sanitary Convention of 1926.

Sir BASIL PETO asked whether Sir Kingsley Wood was aware that in the absence of any quarantine station and ship the crew and passengers were distributed all over the country; and if he was aware that at East Ham and West Ham 24 cases of small-pox arose from contact with a steward from the *Tuscania* who had seven or eight children attending an elementary school at Leyton-road, one of the largest elementary schools in that district?

Sir KINGSLEY WOOD: Yes, Sir. The Minister of Health and I have answered several questions on this matter, giving an exact account of what has taken place. Obviously, however, the conditions which have to be complied with are those of the International Sanitary Convention; but the real lesson of the whole affair is the necessity for vaccination.

Sir F. HALL asked whether, as Sir KINGSLEY WOOD had admitted that vaccination was the method that ought to be adopted, the Government contemplated bringing in a measure to enforce vaccination?

No reply was given.

Disposal of London Refuse.

Sir ALFRED KNOX asked the Minister of Health if he would send down an official from his Department to report on the system of disposal of London refuse at Little Britain, in Middlesex, and at Iver, in Buckinghamshire, of which constant complaint had been made and which was such as to cause danger of an epidemic.—Sir KINGSLEY WOOD replied: Mr. Dawes, the Public Cleansing Inspector of the Department, has recently inspected refuse tips at Little Britain and Iver, and the conditions there are described in his report on the public cleansing service of London which was published in March. My right hon. friend has appointed a Departmental Committee to consider that report and to recommend what measures should be taken on it. In the meantime my right hon. friend is making further inquiries into the circumstances at Iver where he understands a new tip has been started.

BATH ROYAL UNITED HOSPITAL.—The buildings of this hospital in the centre of the city are to be used as a municipal technical college, and the hospital is to be transferred to the building at Combe Park recently vacated by the Ministry of Pensions. The City Corporation is paying £30,000 for the old buildings.

PROGRESS OF MIDDLESEX HOSPITAL.—Last year the number of in-patients treated to a conclusion at this hospital was 6271, as compared with 5512 in 1927. Out-patients made more than a quarter of a million attendances. The expenditure was £100,000 and the total income £83,000. Admissions to the Middlesex Cancer Hospital numbered 718, and the number treated to a conclusion 712, as compared with 546 in the preceding year.

Obituary.

FRANK COLE MADDEN, C.M.G., M.D. MELB., F.R.C.S. ENG.

DR. F. C. Madden takes a high place among the many men of English race who have given their lives to the service of Egypt, for he probably did more than any other of his generation to raise the standard of practical surgery and medical education in that country. Modern medicine can play so large a part in improving Egyptian life that the ultimate effect of such work as his is likely to be very large indeed, and his death at Cairo on April 26th at the age of 56 will be deplored not only by those who knew him, but by all who saw the importance of what he had done and was doing.

Born at Melbourne, Australia, Frank Cole Madden was the son of D. A. Madden, of Sydney, and was educated at the Scotch College, Melbourne, and afterwards at Melbourne University, where he distinguished himself as a student. After holding resident posts at Melbourne Hospital in 1894 he came to London to study at St. Mary's Hospital for the Fellowship of the Royal College of Surgeons, which he gained in 1896. In the same year he was appointed resident medical officer at the Hospital for Sick Children, Great Ormond-street, and there came in contact with the late Edmund Owen, then surgeon to the Hospital, whose niece he afterwards married.

Madden started his successful career in Egypt in 1898, when he was appointed a surgeon at the great Cairo hospital of Kasr-el-Ainy, and surgical teacher in the Ministry of Public Instruction, as the Ministry of Education was then called. As medical officer of the Anglo-American Hospital and the Victoria Deaconess Hospital, he not only did most of the surgical work required for the members of the British community, but also had a large practice among the Egyptian population of Cairo, and indeed of the whole of Egypt. Among his appointments were those of medical adviser to the High Commissioner for Egypt and to the British Consulate. But it was not so much in his large official and private practice that he did his most lasting work as in his labours at the Kasr-el-Ainy Hospital. To this institution, which now has 1000 beds, he devoted his chief energies, and as Professor of Surgery in the School of Medicine over many years he had as his pupils almost all the successful Egyptian surgeons of the present day. An immense amount of clinical material helped him to make valuable contributions to the surgery of bilharziasis, and he published a book on the "Surgery of Egypt" besides chapters in various systems of surgery and papers of surgical interest in the professional journals. During the war he was a civil surgeon attached to the Egyptian Expeditionary Force from 1915 to 1918, and was in charge of the surgical division in two military hospitals and at Kasr-el-Ainy. When a few years ago he retired from surgical and general practice it was to give himself with closer application to medical education and administration. How strenuously he was occupied may be gauged from the fact that at the time of his death he was not only Dean of the Faculty of Medicine and Director of the Kasr-el-Ainy Hospital, but was also acting Rector of the State University. For the past few years he had handled nearly all the details of the vast reorganisation of the Faculty, hospital, and school. A man of great ambitions, he could not rest until he had seen the fruition of his plans, which were to make the medical school at Cairo the equal of any in the world. He worked with such perseverance and unfailing good humour that difficulties which appeared insurmountable seemed to melt away and the proposed new hospital and medical school on Rhoda Island began to take concrete form. It was a happy coincidence that his scheme of development should have reached completion on the occasion of the international conference which took place last

December at the centenary celebrations of the school. It was on his shoulders that the chief burden of the Congress fell. How heavy this burden was is clear from the account of the proceedings published in THE LANCET of Jan. 12th, and from the supplementary note by Dr. Madden himself in our issue of Feb. 16th, and there can be no doubt that much of the success was due to his authority and leadership. In recognition of his work in this connexion he was created C.M.G. in the New Year's Honours, having previously received the O.B.E., and several Egyptian decorations.

Madden's abounding energy made it possible for him to get through a great deal more work than most men. Conscientious to a fault, his industry and devotion to duty were an example to all who came in contact with him. Among his colleagues and students he was deservedly popular, for he was sympathetic, unselfish, and ready to help in work or in overcoming difficulties. In addition to his official duties he took an active part in the public life of Cairo. An excellent tennis player, he was frequently to be seen at the Gezira Club, at which place and also in the Turf Club his genius for friendship made him a much sought-after companion, for his quiet kindliness and good nature won him general esteem. He had the confidence of his colleagues, Egyptian and European alike, and the respect in which he was held by the medical profession of Egypt is evident from the note in the *Times* of April 27th by the Egyptian Minister of Foreign Affairs, Dr. Hafez Afifi, one of his old pupils, who is now visiting this country.

Dr. Madden married in 1900 Madeline, daughter of the late Dr. William Cox of Winchcombe, Gloucestershire, who survives him with two daughters and two sons, one of whom is studying medicine in London.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At a congregation held on April 26th the following degrees were conferred:—

M.D.—*W. S. Hunt, *A. C. Hampson, William Brockbank, and William Smith.

* By proxy.

M.B. and B.Chir.—J. D. R. Murray, J. G. Milner, and T. D. Morgan.

M.B.—C. A. Francis, Edward Clayton-Jones, and E. A. E. Palmer.

B.Chir.—E. B. Murrell.

UNIVERSITY OF LONDON.—At recent examinations the following candidates were successful:—

DIPLOMA IN PSYCHOLOGICAL MEDICINE.

With Special Knowledge of Psychiatry.—Joseph Braithwaite and Catherine M. Hext.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—An ordinary Comitia of the College was held on April 25th with Sir John Rose Bradford, the President, in the chair. The following Members of the College were elected to the Fellowship:—

Richard Walter Marsden, Rupert Waterhouse, Arthur Gurney Yates, Kenneth Douglas Wilkinson, Thomas Lionel Hardy, Geoffrey Bourne, Constantine Trent Champion de Crespigny, Archibald Cathcart Roxburgh, Basil Thomas Parsons-Smith, Arthur William Mickle Ellis, Harold Gardiner-Hill, Joseph Harold Sheldon, John Maurice Hardman Campbell, James Henry Dible, Donald Hugh Paterson, John Crighton Bramwell, Alfred Frank Tredgold, Hugh Gainsborough, Charles Hallilley Kellaway, Arthur Henry Douthwaite, Donald Hunter, and Hubert Maitland Turnbull.

Nominated by the Council under By-law XXXVIII. (*b*):

Charles Arthur Lovatt Evans, F.R.S.

The following candidates were elected Members of the College:—

Robert Stevenson Aitken, John Anderson, Ronald Winston Brookfield, Walter Eric Chiesman, Hugh Anthony Clegg, Gladys Mary Evans, Fergus Robert Ferguson, Walter Edward Fisher, Hugh Gregory Garland, Hector Kenneth Goadby, Cyril Arthur Keele, Alexander Joseph May, Manek Meherwanji Mehta, Louis Minski, Alan Gordon Ogilvie, William Esmond Rees, Hoe Min Sein, Eric Walter Skipper, William Raymond Courtenay Stowe, Moses Myer Suzman, Pendrill Charles Varrier-Jones, William Swanson Whimster, and Cyril Erskine Woodrow.

On the nomination of the President, Dr. F. E. Fremantle, M.P., was appointed to represent the College on the British Social Hygiene Council and to act as delegate to the Fourth Imperial Social Hygiene Congress to be held in London from July 8th to 12th.

A communication was received from the University of London intimating that the new Senate would be constituted towards the end of May or the beginning of June. The President explained that in accordance with the new constitution the College would no longer be represented on that body.

A communication was received from the Ministry of Health asking the College to proceed with the revision of the "Nomenclature of Diseases." On the nomination of the President, Dr. W. C. Bosanquet was elected secretary of the Revision Committee, the personnel of which will be elected at the next Comitia.

It was reported that with the concurrence of the President of the College the Medical Department of the Admiralty have awarded the Gilbert Blane Gold Medal for 1929 to Surgeon-Lieut. Commander Thomas Norman D'Arcy.

At the request of the Home Office the College has submitted a panel of names of persons suitable to fill the vacancy caused by the resignation of Sir Seymour Sharkey from the Advisory Committee on the Administration of the Cruelty to Animals Act.

Dr. O. K. Williamson was appointed a delegate to the Centenary Celebration of the South African College to be held at Cape Town from Oct. 1st to 5th.

Lord Dawson of Penn and Dr. A. P. Beddard were elected to serve, together with the President, on the Mackenzie Mackinnon Research Fund Committee (see p. 933).

Licences to practise were conferred upon 108 candidates who have passed the Final Examination in Medicine, Surgery and Midwifery of the Conjoint Board and have complied with the by-laws of the College. The following are the names and medical schools of the successful candidates:—

E. G. Abdel-Malek, Birmingham; D. A'Brook, Univ. Coll.; Annie D. M. Adams, Oxford and King's Coll.; C. L. Ahluwalia, Punjab and Charing Cross; Annie F. Allport, Royal Free; C. Arthur, Cambridge and St. George's; J. C. Arthur, Durham; S. Alstead, Liverpool; A. R. Banham, Cambridge and Middlesex; I. T. Barling, Cambridge and St. Thomas's; J. R. J. Beddard, St. Bart.'s; D. Bielenky, Westminster; H. E. Blake, Cambridge and St. Thomas's; M. Bloom, Cardiff; R. K. Bowes, Liverpool; A. M. Boyd, St. Bart.'s; J. S. B. Bray, Cambridge and St. Bart.'s; A. D. D. Broughton, Cambridge and London; C. W. F. Burnett, Univ. Coll.; E. L. Butler, Birmingham; C. E. Caudwell, Westminster; M. A. Chamberlain, Manchester; P. P. Chandu Nambiar, Bombay and Birmingham; Rosa O. J. Clark, Royal Free; J. O. Clyde, Middlesex; J. R. Colville, St. Bart.'s; S. J. Cope, St. Thomas's; D. M. Craig, Middlesex; F. A. D'Abreu, Birmingham; A. M. D'Cotta, Singapore and St. Mary's; J. G. Dathan, St. Thomas's; H. R. J. Donald, Oxford and Manchester; E. S. Fossey, Otago; I. Friedman, Guy's; Dorothea L. Gee, Royal Free; T. Giblin, Melbourne and St. Bart.'s; A. Gilpin, King's Coll.; Joan Goodger, Charing Cross; H. Gordon, Durham and Middlesex; E. Grundy, Leeds; P. N. Hanson and K. W. D. Hartley, St. Bart.'s; Dorothy C. Hay, King's Coll.; G. Herbert, Cambridge and St. Thomas's; J. H. Howells, Cardiff and Middlesex; D. Hugo, Cape and Guy's; A. H. Hussein, Cairo and Edinburgh; A. E. Hutton, Westminster; K. L. James, Univ. Coll.; W. H. P. Jonas, Oxford and St. Thomas's; C. Jones, Leeds; Mary E. H. Jones, Cardiff and Charing Cross; R. A. Jones, Cardiff and Univ. Coll.; L. D. Khatri, Bombay; H. V. Knight, Cambridge and St. Bart.'s; R. G. Krishman, Bombay and Birmingham; R. J. Krogh, Bristol; A. J. C. Latchmore, Leeds; J. C. Lee, Cambridge and London; J. M. Leggate, Liverpool; F. G. Lewis, Birmingham; O. V. Lloyd-Davies, Middlesex; J. V. Lucas, Cambridge and King's Coll.; H. G. McGregor, Guy's; C. G. Millman, King's Coll.; A. J. Moffett, Birmingham; B. A. Moss, Guy's; L. P. Naz and W. L. Neustatter, Univ. Coll.; J. C. Nicholson, Oxford and St. Bart.'s; R. J. L. O'Donoghue, Guy's; J. R. Owen, Birmingham; E. R. G. Passe, Melbourne and London; A. S. Philips and R. K. Price, St. Bart.'s; K. H. Pridie, Bristol; A. B. Rao, Madras and Middlesex; J. B. A. Reynolds, Cambridge and St. Bart.'s; R. A. C. Rice, St. Bart.'s; N. W. Roberts, Liverpool; C. St. Johnston, Birmingham; J. G. Sandrey, Sydney; R. W. Scanlon, Madras and St. Thomas's; C. P. Scott, St. Thomas's; J. D. W. Shedden, Birmingham; M. D. Shephard, Univ. Coll.; B. Singer, London; W. F. Skaife, Oxford and St. Bart.'s; D. B. Smallshaw, Guy's; W. C. Smallwood, Birmingham; E. S. Stern, Cambridge and Univ. Coll.; J. B. Sugden, Leeds; L. Sumitra, St. Mary's; N. C. Tanner, Bristol; L. Taylor, Sheffield; K. S. Thom, Birmingham; R. S. Thomas and A. E. Treweek, Guy's; J. J. van Niekerk, Cape and Guy's; E. Vitenson, Leipzig and Guy's; W. J. Walter, Oxford and St. Bart's; G. J. S. West, Bristol; S. J. Wheeler, Guy's; B. Williams, Edinburgh; D. C. Williams, Cardiff; E. R. Williams, St. Mary's; Sybil O. Williams, Calcutta and Royal Free; and Kathleen Wilson, Cambridge and King's Coll.

A supplementary list of licentiates is being issued later for candidates whose examinations were not completed when the above list was compiled.

Society of Apothecaries of London.—At recent examinations the following candidates were successful:—

Surgery.—B. L. Fishout, Cardiff: E. T. Garthwaite, St. Bart.'s Hosp.; E. Marks, St. Mary's Hosp.; A. N. De Monte, St. Thomas's Hosp.; C. J. Poh, Edinburgh; and P. U. Rao, Charing Cross Hosp.

Medicine.—B. L. Fishout, Cardiff; D. F. Michael, St. Mary's Hosp.; C. J. Poh, Edinburgh; and H. Whitby, London and St. Mary's Hosps.

Forensic Medicine.—H. M. Feldman, Leeds; H. Murkus, Birmingham; and A. W. Tam, Singapore and Edinburgh.

Midwifery.—L. Banszky, Middlesex Hosp.; G. R. Davies, St. Mary's Hosp.; C. W. Ellison, St. Bart.'s Hosp.; B. C. Ghose, Durham; C. F. H. Quick, St. Mary's Hosp.; and T. Singh, Charing Cross Hosp.

The Diploma of the Society, entitling them to practise medicine, surgery, and midwifery, was granted to H. M. Feldman and D. F. Michael.

Aberdeen University Club, London.—The eighty-first half-yearly dinner of this club will be held at the Trocadero Restaurant, Piccadilly-circus, on Thursday, May 16th. The hon. secretary's address is 9, Addison-gardens, W. 14.

International Society for Microbiology.—The first congress of this Society, which was to take place in Paris in October, 1929, has been definitely postponed until June 25th, 1930. The programme, which has already been published in various scientific journals, will stand.

Among those called to the Bar on April 24th were Dr. W. E. Masters (Middle Temple) and Dr. L. P. Lockhart (Gray's Inn).

The foundation-stone of the Eastman Dental Clinic, attached to the Royal Free Hospital, was laid on Tuesday last by the Prince of Wales. His Royal Highness was received by Lord Riddell, the Chairman of the Hospital, and the Prime Minister and the Minister of Health were present. The Prince of Wales emphasised the significance of a gift of such generous character from an American citizen to a great London Hospital, and the Prime Minister dwelt on the value to a nation of good teeth.

Presentation to a Medical Man.—Dr. Charles Firth, formerly of Gravesend, on the occasion of his retirement from practice and his removal from the county, was recently the recipient of a presentation from members of the Kent Local Medical and Panel Committees in the form of a silver salver as a token of the high esteem in which he was held by his colleagues and a mark of the appreciation of the very valuable assistance given to the committees over a long term of years. Owing to his illness the presentation was carried out at Dr. Firth's residence in Twickenham by a deputation of the members of the committee. Dr. Firth was for a number of years chairman or vice-chairman of the committees and was also a member of the Insurance Committee for the county of Kent and its Medical Service Subcommittee.

Factory Chimneys and Rainfall.—At the annual meeting of the Manchester Literary and Philosophical Society on April 23rd Dr. Ashworth, who has been investigating the relation of rainfall to smoke pollution in Rochdale, suggested that smoke from mill chimneys has an appreciable influence on rainfall. He has found that over a period of ten years in Rochdale Sundays were the driest day of the week and had an average rainfall 13 per cent. lower than the average per day of the whole week. In Rochdale also more rain fell during the day period of week-days—when the mills were working—than at night: whereas the reverse was true of Sundays. A close relation was found between the rate at which rain falls (in inches per hour) and the fluctuations in the emission of smoke.

Nitrogenous Fertilisers from the Air.—Addressing the British Science Guild at the Mansion House, London, on April 24th, Sir Frederick Keeble, F.R.S., said that in this country and abroad nitrogen of the air was now being made into fertilisers at the rate of over 1 million tons per year. In 1913, farmers throughout the world used annually about 750,000 tons of nitrogen in its various forms; in 1928 the total agricultural consumption amounted to nearly 1½ million tons. Different nations were acquiring the nitrogen habit at different rates. Holland led the way, followed by Belgium and Germany, with Japan fourth, Egypt fifth, and Great Britain sixth. France lagged behind England and the United States was well below Western European countries. The present price of fertiliser was low; indeed it might be called the only cheap thing in the world to-day. The application of 1 cwt. of nitrogenous fertiliser to the acre gave an increase of 2½ cwt. per acre of cereals and 1 ton of "roots" in the case of potatoes or swedes; and so on for other crops. Already 6000 workers were employed at the factory at Billingham, which had an output of 50,000 tons in 1924, and was expected to reach an output of 750,000 tons by 1930.

We regret to announce that Dr. William McConnel Wanklyn, consultant in the diagnosis of small-pox to the London, Middlesex, and Essex County Councils, died on Tuesday in his office at the County Hall, Westminster. A paper by him appeared in our last issue.

The Royal Victoria Infirmary, Newcastle-on-Tyne, has received a cheque for £2000 from an anonymous donor for the purchase of radium for the treatment of cancer.

St. George's Hospital.—It is stated that this hospital will shortly receive an unexpected legacy of between £15,000 and £20,000, which will go towards reducing the overdraft of about £40,000.

We are informed that the honorary assistant surgeons of the Golden-square Throat, Nose and Ear Hospital, London, will in future be allotted their own sessions for operating upon in-patients.

St. Cross Hospital, Rugby.—On Saturday last the Duchess of York opened the new "Arthur James" out-patient department and casualty wards, given by Mrs. Arthur James, Her Royal Highness's godmother, in memory of her husband. More than one-third of the population of Rugby contributes regularly to the hospital.

Colony for Mental Defectives.—It is stated that great difficulty is found in providing accommodation for mental defectives in the county of Cheshire. The Cheshire County Council, in coöperation with the city of Chester and the county boroughs of Wallasey and Birkenhead, has been dealing with the problem of accommodation for these mental cases, and a large estate near Holmes Chapel has been purchased for use as a colony for the mentally deficient.

Kensington General Hospital.—The Marquis of Carisbrooke presided last week at a Mansion House dinner on behalf of the fund for rebuilding the Kensington, Fulham, and Chelsea General Hospital. It was explained that although only £20,000 of the necessary £100,000 had yet been raised, most of which had been expended on the purchase of the site, it had been found impossible to delay the rebuilding, and the work is now proceeding, most of the old structure having been demolished.

Rating of Hospitals.—Middlesex County Council last week agreed that hospitals and similar institutions supported wholly or partly by voluntary contributions should be exempt from rating. The County Valuation Committee were asked not to offer any opposition in the event of proposals being made with that object. Alderman G. Marlow Reed, vice-chairman of the Council, stated that "by exempting its hospitals and charitable institutions from rates Middlesex has led the way and set an example which other county councils are certain to follow."

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Tuesday, May 7th.—5.30 P.M., Orthopædics (Cases at 4.30 P.M.). Annual General Meeting: Election of Officers and Council. Clinical Cases: Mr. Laming Evans: A Case of Kienbock's Disease of the Semilunar bone. Mr. C. Lambrinudi: A Case with Primary Torsion of the Tibiæ. Other cases will be shown.

Wednesday.—4.45 P.M., Surgery: Sub-Section of Proctology. Annual General Meeting: Election of Officers and Council. Discussion (at 5 P.M.) on Fistula-in-ano. Opener: Mr. J. P. Lockhart-Mummery. Followed by (1) Mr. H. A. Harris, on the Hind-end of the Embryo in Relation to Fistula-in-ano, (2) Mr. C. Naunton Morgan on the statistical side. The Annual Dinner will take place at the Trocadero Restaurant, Piccadilly-circus, W. 1, on the same evening, at 8 P.M. for 8.30 P.M.

Thursday.—8.30 P.M., Neurology. Annual General Meeting: Election of Officers and Council.

Friday.—5.30 P.M., Clinical: (Cases at 5 P.M.) Annual General Meeting: Election of Officers and Council. Cases: Dr. Sibyl Eastwood: 1. Meningioma after Operation. 2. Diverticulum of the Stomach. Dr. O. Leyton: 3. Persistent Hypoglycæmia following Diabetes Mellitus. Mr. Cecil P. G. Wakeley: 4. Acute Osteomyelitis of the Tibia after Bone Grafting. Dr. Norman Hill: Multiple Deformities. Other cases will be shown.

Saturday and Sunday.—Balneology and Climatology: Annual Provincial Meeting at Harrogate.

ROYAL SOCIETY OF ARTS (Indian Section), John-street, Adelphi, London, W.C.

Friday, May 10th.—4.30 P.M., Mr. P. Johnston-Saint, F.R.S. Edin.: An Outline of the History of Medicine in India. (Sir George Birdwood Memorial Lecture.)

WEST KENT MEDICO-CHIRURGICAL SOCIETY, Miller General Hospital, Greenwich, S.E.

Friday, May 10th.—8.15 P.M., Mr. C. A. Joll: Radium: Its Place in the Treatment of Malignant Disease. Presidential address.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

Monday, May 6th, to Saturday, May 11th.—Medical Society Lecture Room, 11, Chandos-street, Cavendish-square, W., M.R.C.P. Course of Instruction. Lectures on Tuesdays and Fridays at 8.30 P.M. Tues., 7th, Dr. B. T. Parsons-Smith: The Assessment of Valvular Heart Disease. Frid., 10th. Dr. B. T. Parsons-Smith: The Treatment of Cardiac Failure.—King's College Hospital, Denmark Hill, S.E. Demonstration in the Children's O.P. Department by Dr. Wilfrid Sheldon on Wed., at 2.30 P.M. No fee.—Cancer Hospital, Fulham-road, S.W. Demonstration by Mr. A. Lawrence Abel on Frid., at 2 P.M. No fee.—West End Hospital for Nervous Diseases, 73, Welbeck-street, W., Lecture-demonstration illustrated by cases. Daily at 5 P.M.—Maudsley Hospital, Denmark Hill, S.E., Course in Psychological Medicine. Every afternoon for four weeks.—Central London Ear, Nose and Throat Hospital, Gray's Inn-road, W.C., Intensive course of clinical instruction. All day course.—London Lock Hospital, Dean-street, W., *Afternoon course in* Venereal Disease for one month.—St. John's Hospital, Leicester-square, W.C., Course in Dermatology. Clinical instruction every afternoon.—Further particulars from the Fellowship of Medicine.

NATIONAL HOSPITAL, Queen-square, W.C.

Monday, May 6th.—12 noon, Dr. J. G. Greenfield: The Cerebro-spinal Fluid. 2 P.M., Dr. George Riddoch: Out-patient Clinic. 2.30 P.M., Dr. Adie: The Localisation of Cerebral Tumours.

Tuesday.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Critchley: Neurological Complications of Vertebral Diseases.

Thursday.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Mr. Julian Taylor: Lesions of Peripheral Nerves.

Friday.—12 noon, Dr. Purdon Martin: Anatomy and Physiology of Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Mr. Elmquist: Demonstration of Re-educational Methods.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

Monday, May 6th.—10 A.M., Dr. Dowling: Skin Department. 2 P.M., Mr. Donald Armour: Operations. 2 P.M., Dr. Ironside: Medical Out-patients.

Tuesday.—10 A.M., Medical Registrar: Ward Visit. 2 P.M., Mr. Addison: Operations. 2 P.M., Mr. Sinclair: Surgical Out-patients.

Wednesday.—10 A.M., Dr. Owen: Children's Out-patient Department. 2 P.M., Mr. Tyrrell Gray: Operations. 2 P.M., Dr. Scott Pinchin: Medical Out-patients.

Thursday.—10 A.M., Dr. Grainger Stewart: Neurological Department. 11.30 A.M., Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. MacDonald: Genito-Urinary Out-patient Department.

Friday.—10 A.M., Dr. Pritchard: Medical Ward Visit. 12 noon, Dr. Shaw: Clinical Demonstration. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.

Saturday.—9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Children's Medical Out-patient Department. 10 A.M., Resident Assistant Surgeon: Ward Visit. Medical and Surgical Out-patients at 2 P.M., daily. Operations. Special Departments daily, 10 A.M. to 5 P.M., Saturdays 10 A.M. to 1 P.M. Special Classes in Anæsthetics and Operative Surgery.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

Monday, May 6th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

Tuesday.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

Wednesday.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

Thursday.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat and Ear Clinics. Operations.

Friday.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.

EAST LONDON HOSPITAL FOR CHILDREN, Shadwell, E.

Wednesday, May 8th.—4.15 P.M., Clinical Meeting and Discussion on the Significance of Otitis Media in Influenza, to be followed by demonstration of cases of interest. All practitioners are cordially invited. Tea at 4 P.M.

UNIVERSITY COLLEGE, Gower-street, London.

Thursday, May 9th.—5 P.M., Mr. R. J. Lythgoe: Special Sense Physiology. (Second of six lectures.)

Friday.—4 P.M., Prof. A. J. Hall: Some of the Sequels of Epidemic Encephalitis (Lethargica). (Last of two public lectures.)

ST. THOMAS'S HOSPITAL, Albert Embankment, Westminster Bridge, S.E.

Thursday, May 9th.—5 P.M., Prof. S. J. Cowell: Dietetics. (Second of six lectures.)

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

Wednesday, May 8th.—3.15 P.M. (at the Royal Chest Hospital, City-road), Dr. W. Barty King: Cases Illustrating some Difficulties in the Diagnosis of Diseases of the Chest.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

Monday, May 6th.—5 P.M., Dr. H. Haldin-Davis: Drug Eruptions.

Tuesday.—Dr. H. W. Barber: Alopecia Areata and Vitiligo.

Thursday.—Dr. S. E. Dore: Animal Parasites.

Friday.—Dr. G. B. Dowling: Skin Diseases due to Protein Sensitisation.

ROYAL DENTAL HOSPITAL POST-GRADUATE *LECTURES.*

Wednesday, May 8th.—6 P.M., Mr. J. G. Turner: Pain.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

Tuesday, May 7th.—4.15 P.M., Dr. J. C. Bramwell: Cardiac Œdema and its Treatment.

Friday.—4.15 P.M., Mr. D. L. Sewell: Demonstration of Otological and Laryngological Cases.

Appointments.

Coope, Robert, M.D. Liverp., M.R.C.P. Lond., has been appointed Hon. Assistant Physician, Liverpool Royal Infirmary.

Coope, H. M., M.B., Ch.B. Manch., to be Certifying Surgeon under the Factory and Workshop Acts for Lytham.

Vacancies.

For further information refer to the advertisement columns.

Aberdeen, Royal Hospital for Sick Children.—Hon. Asst. S.

Ashton-under-Lyne, District Infirmary.—H.S. At rate of £150.

Bath, Royal United Hospital.—H.P At rate of £120.

Bedford County Hospital.—Asst. H.S. At rate of £130.

Birmingham and Midland Eye Hospital, Church-street.—Surgical Registrar.

Blackburn and East Lancashire Royal Infirmary.—Fourth H.S. At rate of £130.

Bolingbroke Hospital, Wandsworth Common, S.W.—Clin. Asst. to Ear, Nose and Throat Dept. £75.

Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.

Bristol University.—Chair of Physiology.

Burnley, Victoria Hospital.—H.S. At rate of £125.

Bury St. Edmund's, West Suffolk General Hospital.—H.S. £150.

Cambridge, Papworth Village Settlement.—H.P. £100–£200 per annum.

Croydon County Borough.—Asst. M.O.H. and Asst. School M.O. £600.

Derby Guardians Institution and Infirmary.—Second Res. M.O. £250.

East London Hospital for Children, &c., Shadwell, E.—Res. H.S. Also Res. Cas. O. Each at rate of £125.

Folkestone, Borough of.—Asst. M.O.H. £600.

Golden-square, Throat, Nose and Ear Hospital, W.—Clinical Assistant.

Gordon Hospital for Rectal Diseases, Vauxhall Bridge-road, S.W. H.S. £75. Also Hon. Asst. Surgeon.

Gravesend and North Kent Hospital.—Jun. H.S. At rate of £80.

Hackney Hospital, High-street, Homerton, E.—Jun. Asst. M.O. £350.

Hospital of St. John and St. Elizabeth, 60 Grove End-road, N.W.—Res. H.P. At rate of £100.

Hull Royal Infirmary.—Cas. H.S. At rate of £130.

Ilford Borough Council.—Asst. School Dental Surgeon. £450.

Lambeth Parish Hospital, S.E.—Jun. Asst. M.O. £200.

Leamington Spa, Warneford General Hospital.—Res. H.P. Also Res. H.S. Each £165.

Leeds Public Dispensary.—Jun. Res. M.O. £150.

Leicester Royal Infirmary.—Third Res. Anæsthetist. At rate of £250.

Lenham Sanatorium.—Asst. M.O. £400.

Liverpool Eye and Ear Infirmary, Myrtle-street.—H.S. to Ear, Nose and Throat Dept. £100.

London Hospital, Whitechapel, E.—Jun. Gynæcological First Asst. £300.

Manchester Royal Infirmary.—Hon. Asst. Physician to Out-Patients.

Manchester University.—Dr. Robert Angus Smith Scholarship. £150.

Manchester, Victoria Memorial Jewish Hospital, Cheetham.—Hon. Aural Surgeon. Also Sen. H.S. £250.

Margate Royal Sea-Bathing Hospital.—H.S. At rate of £100.

M.A.B. Mental Hospitals Service.—Sen. Asst. M.O. £650.

Mexborough, Yorks, Montagu Hospital.—Jun. H.S. £100.

Middlesex County Council.—Asst. M.O. £600.

Miller General Hospital, Greenwich-road, S.E.—Out-Patient Officer. At rate of £150.

Newcastle-upon-Tyne, University of Durham College of Medicine.—Whole-time Assistant. £400.

Nottingham Children's Hospital.—Res. H.S. At rate of £130.

Nottingham General Hospital.—Res. Cas. O. At rate of £200

Romford, Oldchurch Hospital.—Third Res. Asst. M.O. £250.
Royal Free Hospital, Gray's Inn-road, W.C.—Asst. Morbid Anatomist and Curator of Museum. £300.
Royal National Orthopædic Hospital, 234, Great Portland-street, W. Surgical Registrar. At rate of £105.
Royal Northern Hospital, Holloway, N.—H.S. At rate of £70.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—Anæsthetist. £30.
St. Bartholomew's Hospital, E.C.—Asst. Physician.
St. Peter's Hospital for Stone, Henrietta-street, Covent Garden, W.C. Clinical Pathologist. £250.
Sheffield, Winter-street Hospital.—Asst. Tuber. O. £450.
Singapore Municipality of Straits Settlements.—Health Dept. Asst. Municipal Health Officer. £980.
Southampton County Borough.—Asst. M.O.H. £600. Also Asst. School Dentist. £450.
Taunton and Somerset Hospital.—Jun. House M.O. At rate of £100.
University of London.—University Chair of Anatomy. £1000.
Walsall General Hospital.—Jun. H.S. At rate of £100. Also H.S. At rate of £125.
Whipps Cross Hospital, Whipps Cross-road, Leytonstone, E.—Res. Asst. M.O.'s. Each £300.
Will Edmonds Clinical Research Fund.—Fellowship. £500.
Winchester, Royal Hampshire County Hospital—H.P. At rate of £150. Also Hon. S. in Ordinary.
Wolverhampton, Royal Hospital.—Cas. O. and Res. Anæsthetist. At rate of £125.
Wolverhampton and Midland Counties Eye Infirmary.—H.S. £200.

Births, Marriages, and Deaths.

BIRTHS.

Dickson.—On April 26th, the wife of W. Muir Dickson, F.R.C.S., *of a son.*

Fletcher.—On April 28th, at Harley-street, W., the wife of Herbert Morley Fletcher, M.D., F.R.C.P., *of a daughter.*

Harkness.—On April 25th, at Welbeck-street, W., the wife of Robert Coltart Harkness, F.R.C.S., Bermondsey Hospital, S.E., of a daughter.

Holden.—On April 23rd, at Byron House, Aylesbury, the wife of Dr. S. J. C. Holden, of a daughter.

Moor.—On April 27th, at Granville Lodge, Westgate-on-Sea, the wife of Dr. Frewen Moor, *of a son.*

Salisbury.—On April 29th, at Woodlands, 28, Billing-road, Northampton, to Constance, wife of Walter Salisbury, M.D., *M.S., F.R.C.S.*—a daughter.

Wilson.—On April 24th, the wife of Archibald Wilson, O.B.E., M.C., M.B., Ch.B., Moselle House, High-road, Tottenham, N., of a son.

DEATHS.

Bailey.—On April 25th, at Geneva, William Henry Bailey, M.D., Barrister-at-Law, late of Featherstone Hall, Southall, Middlesex.

Dawes.—On April 18th, 1929, very suddenly, Joseph William Dawes, M.B., C.M. Edin., of Denbigh House, Longton, Staffordshire, aged 65 years.

Frost.—On April 22nd, at Primrose Hill, Langton Matravers, George Frost, M.D., aged 75.

Henderson.—On April 29th, at the Sanatorium, Mundesley, George Thompson Henderson, B.A., B.Chir. Camb., M.R.C.S., L.R.C.P.

Lee.—On April 27th, died instantly in an accident, Edward Sidney Thomas Lee, elder son of Dr. and Mrs. W. E. Lee, *of 17,* Princes-avenue, Muswell Hill.

Rabagliati.—On April 28th, at Leeds, Andrea Francis Honyman Rabagliati, M.D., F.R.C.S.E., late of Durban and Nairobi, aged 50.

Smith.—On Feb. 25th, 1929, at the American Mission Hospital, Ranipet, South India, of acute intestinal obstruction, James Ironside Smith, Indian Civil Service, District and Sessions Judge of Chittoor, the dear husband of Amy M. Thoms, M.D., M.R.C.P.

Wilde.—On *April 23rd,* at his residence, 23, The Circus, Bath, Percy Roberts Wilde, M.D. Aberd., M.B., C.M., Hon. Physician Lansdown Hospital and Nursing Home, Bath, in his 72nd year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Donations and Bequests.—*Mr. John Barrow* Hope, of Wyngates, Bournemouth, left, after the death of his wife, £1000 each to the Children's Convalescent Home, West Kirby, the Lear Home of Recovery, West Kirby, Manchester Royal Infirmary, Ancoats Hospital, Manchester, St. Mary's Lying-in Hospital, Manchester, and the Imperial Cancer Research Fund.—Mr. Alfred Hobson, of Redcliffe, Dawlish, who left estate of the value of £110,000, after various gifts including £3000 to the Cancer Hospital, Fulham-road, S.W., and £500 each to the West of England Eye Infirmary and the Zenana Mission, left the residue of the estate—i.e., the bulk of the property—to such charitable objects as his executors shall determine.—Mrs. Florence Churchill Hale, of Hyde Park-place, W., left £500 each to the London Hospital, the Dental Hospital, Leicester-square, and the British Home for Incurables, Streatham, less sums given after the date of her codicil.

Notes, Comments, and Abstracts.

SOME FACTORS WHICH HAVE MADE FOR THE DECLINE OF NATIONS.*

By Sir Thomas Oliver, M.D., F.R.C.P.,

VICE-CHANCELLOR OF THE UNIVERSITY OF DURHAM.

Just as many factors contribute to the uplifting of a race, so also do many factors operate in causing its decline. When we come to consider the pathological causes which lead to a racial decline, we find that it is less through severe forms of epidemic disease sweeping over a country and decimating it than of widespread endemic disease which, lingering in a country, causes a high death-rate of its young people, undermines the health of its adults so that they fail to reproduce physically strong descendants. The civilisation of Greece is one of the outstanding facts of history. In the fourth century B.C. a change had taken place in the Greek character. It was not due to increased immorality, though morality had altered behaviour. Men and women still preferred home to city life: patriotism had, however, declined, and the people had lost their manly vigour and intellectual strength. To what extent decay of religion contributed to this end it is difficult to say. It was at this period that malaria is known to have been prevalent in Greece, but, unlike such epidemic diseases as small-pox and plague, malaria tends to become chronic; it does not weed out a race all at once, but it creates general debility and undermines virility. The geographical conditions of Greece with her mountain valleys lent themselves to the development and spread of malaria, for to-day, even after several years of hygienic efforts, 40 per cent. of the people are said to be suffering from the malady. The disease was known to Hippocrates, while Galen in the second century A.D. accurately describes the seizures with their quotidian and tertian peculiarities. It is not known at what date malaria was introduced into Greece or where it came from, but as it is an African disease it was probably introduced by ships trading with Egypt, or it may have come by way of Asia. Herodotus, writing of the people of Egypt who were living in the marshes, states that they were plagued with gnats and at night they wrapped themselves in a net in bed. This was the dawn of the mosquito theory of malaria. One of the effects upon an agricultural people like those of Greece stricken by malaria would be that tracts of land would pass out of cultivation and that those lands thus left derelict would remain undrained and become more and more breeding-grounds of the mosquito. From the peninsula the infection was probably carried by Greek slaves or by *soldiers into* Italy.

Of the early effects of chronic malaria exhibited by the Greeks mention may be made of melancholy; the victims are said to have become neurotic and to have suffered from nervous depression. There has been considerable controversy over the decline of Greek morality which occurred in the fourth century B.C. It was not so much that type of immorality with which the word makes us familiar, as an alteration of the mental powers and temperamental condition of the Greeks, who, losing their nerve, began to take less interest in matters of State and ceased to be initiative. It is not maintained that malaria was the only factor which brought about this change of character in the Greeks, and led to their decline. The Greek had not only lost his religion but his faith, and without faith in something higher than itself no nation can long survive. Success in commerce and her highly developed merchant navy made Greece wealthy and supplied her with the means of gratifying luxurious tastes. Vice was not unknown and wars by their losses had drained the young life of the country. It was not when Greece was writhing under the grip of malaria that her people produced those works of art, literature, and philosophy which will for ever remain outstanding evidences of a height of civilisation no country has since attained.

Malaria in Ancient Italy.

With the exception of a few areas, Italy offers fewer breeding places for the mosquito than Greece. Although there is no definite information as to how malaria was introduced into Italy, it was probably carried thither from Africa by Hannibal's Carthaginian Mercenaries. It was prevalent in the country 50 years B.C., and was endemic in Rome and the Campagna. Here, as in Greece, the malarially affected districts passed out of cultivation. Prof. North, in his book on Roman fever, says that the effect of the disease upon the people was to unfit them for labour, to cause loss of time and money, to diminish their producing powers so that the race, if left to itself, would tend towards moral and physical degradation. Taken all round, malaria is perhaps one of the most incapacitating diseases to which man is liable and is the cause of the greatest amount of sickness. *Rome was a hotbed of malaria, so there was* every probability of her people becoming deteriorated. As a result of frequent wars, and of the country districts having become devastated, there was a rush of people to the large Italian towns and to Rome particularly. Thoughtful statesmen of the period recognised what was taking place and did all they could to get the people to return to the land, but all to no purpose, for economic conditions were unfavourable as well as the change in the national character consequent upon war. Thus overcrowded, the population of Rome gradually changed its outlook upon life.

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* Abstract of a Presidential Address delivered at the Institute of Hygiene, London, on April 25th, 1929.

We have seen how malaria was a factor in enfeebling the Greek character and in causing the people to lose their initiative and purpose, but in the case of the Roman it appeared to produce entirely different effects. Mr. H. S. Jones reminds us of atrocities committed now and then by white men in the tropics, outbursts of savagery, attributable to malaria. I have no direct knowledge of such events having taken place, but it is stated that something of this kind happened in Rome. The pictures of life in the first century A.D. painted by Tacitus and Juvenal show Roman society to have been not only wicked but debased. The extravagant cruelty, the wild desire *for* excitement, and the absence of self-control, point to some psychical defect in the people. I am not prepared to say to what extent, if any, the change in Roman character was a consequence of malaria. Rome had lived her life of luxury and debauchery, and these of themselves were sufficient to change the national character.

Climate and Civilisation.

In the civilised world to-day those nations are certainly the most virile where the seasons vary and the temperature is moderate. Men are stimulated or depressed by climatic conditions. The varying capability of 500 factory operatives in the cities of New York, New Britain, and Connecticut, of 3000 factory operatives in the southern cities between Virginia and Florida, 1700 naval and military students at Annapolis and West Point *was tested by* Ellsworth Huntington in order to test the influence of climate on work. The districts, especially the two first mentioned, are separated by sufficient longitude as to have different types of weather. The experiments were carried on for a year, with the following results. Changes in the barometer had little effect; humidity possessed considerable influence, but temperature was clearly the most important element. All who took part in the experiment were most physically active when the temperature ranged between 60° and 70° F. Change of temperature was helpful, for the people did not work well when the temperature remained constant. The conclusion drawn was that a close agreement exists between the distribution of human energy and climatic and temperature findings—in other words, where civilisation is high a peculiar type of climate prevails. What *is* true to-day was *also* probably true of the past.

As regards climate, while it may contribute to natural progress it cannot be a cause of civilisation. But if it cannot be regarded as a cause, may an alteration of climate not become a contributory circumstance to its decline? Huntington's experiments are interesting as showing the optimum temperature under which work can best be carried on. Surveying the cultural achievements of eight civilisations Spengler, in his "Decline of the West," finds in every instance the same identical laws of birth, growth, maturity, and decline, the decline in every instance being preceded by the domination of intellect over race, or in other words by the influence of overgrown city populations, their arrogance and distaste of agricultural pursuits. To *Spengler, all civilisations* begin with a feudal condition and end in the life of great cities—they pass from the primitive arts to craft, into a period of criticism and greater intelligence, and finally into a stage when life itself, and not what use we make of it, becomes the all-engrossing problem.

Whither Civilisation is Tending.

To-day thoughtful men of the higher nations are asking what civilisation is doing for man, and *whither it is tending?* Modern civilisation is entirely different to any of the past. It is not confined to a small portion of the world's area. Setting aside China, it extends from the Far East through Asia and Europe to America.

Modern civilisation, in the form in which we know it to-day, dates from the introduction of machinery, or what is known as the Industrial Revolution, beginning in England in or about 1760. Machinery did not destroy, but it completely altered the thought and customs of Great Britain by revolutionising the life of the people, gradually transforming them from the serfdom of labour to more dignified types of work and with leisure to enjoy life.

Each age carries its own customs. We might well ask therefore whether the social and economic conditions of our time are altering national character? We are living perhaps too close to events to be able to appraise them at their proper value. The emancipation of woman remains one of *the* important events of our *time*. Young women earning income no longer feel that they are under any obligation to parents or to home, and therefore claim the right to act as they think best. Many of them use their freedom with great discretion and have shown the useful part they can play in social welfare. But we have been discussing not the question of sex nor of personal benefit, but whether modern civilisation will continue *and if possible* be improved. The declining acceptance of the responsibility of motherhood, the disinclination on the part of many women to marry, protracted postponement of the event, limitation of family and easy divorce are circumstances which cannot be ignored by students of racial biology. In our own country the number of unmarried women outstrips that of men. In the United States it is the reverse which prevails. In 1920 there were 9,611,902 unmarried women of 15 years and upwards; the number of unmarried men of the same age-period was 12,987,605, and yet while in the States there are more unmarried men than women there are the same circumstances—viz., few marriages, postponement of the event, and small families or none at all. How are these circumstances likely to influence for good the cause of civilisation?

The Lessons of Experience.

Ancient civilisations concerned themselves with hundreds of thousands of people, modern civilisation concerns itself with millions, all brought into close touch with each other by the abridgment of distance and the spanning of time. The conquest of nature has armed man with powers he never possessed until to-day, so that nations separated by thousands of miles from each other know what is taking place almost simultaneously. Modern civilisation has ceased to follow the customs and traditions of those of more ancient people. It refuses to be bound by the shackles of authority and claims the right of self-assertion. Mechanism and science are the powers which make for human progress. *These bring wealth to a country, also* higher wages, better food, and shorter hours to the workers. The cities tend to become overcrowded, and according to some writers, this is regarded as a prelude of national decline. In the growth, development, and decline of nations there is an analogy to the individual life, but there is a difference—the aged individual cannot recreate youth or revive within himself youthful methods of solving problems, but a nation composed of men and women of various ages can for legislative ends be grouped together, the decisions arrived at showing how the venturesome spirit of youth can be curbed by the experience of age and still the nation remain young.

Conquest, migration, disease, climate, and change of trade routes have all been advanced as causes of failure of the old civilisations. Wealth, luxury, and vice are often mentioned as the cause of the fall of the Roman Empire, while the fall of Babylonian civilisation was the result of wars and excessive taxation. Can our own or any country learn from the experience of past civilisations? It is with nations as with individuals—it is during the years of strenuous effort when men must work and life is frugally lived, that a people is becoming stronger and stronger and rising into power, and not when wealth has accumulated and *luxury prevails that a people is at its best. Are wealth,* luxury, and desire the aim and objects of civilisation? If so, then civilisation appears to develop and to sow the seeds of her own destruction.

ASYMMETRY IN THE ANIMAL BODY.

On April 24th Mr. C. J. Bond read a paper before the Eugenics Society on Hemilateral Asymmetry in Animals and Man, and its Relation to Cross-breeding.

From the genetic point of view, he said, discussion of this problem started from the well-known fact that the vertebrate organism, in common with that of some invertebrates, was built up on a bilateral plan. It might not be too fanciful to regard man, the *individual*, as composed of two *half* individuals joined together along the median plane. These two halves, as far as limbs, muscular structures, sense organs, and certain appendages like ears, horns in cattle, and other structures were concerned, were reduplications or mirror images of the same type. Sometimes bilateral symmetry broke down, and the study of asymmetric cases, both in man and animals, was of much importance.

The prehistoric races of oxen, and those of Eastern countries to-day were characterised, said Mr. Bond, by an upward curve of horn growth. On the other hand, in Western Europe a race of cattle seemed to have arisen with a downward curve. These differences were still seen in modern breeds, such as longhorns, Herefords, Lincolns, and Welsh cattle. Examples of asymmetry, in which a downward curve was present on one side and an upward curve on the other in the same individual, were especially frequent in cross-bred animals, as in modern shorthorn.

Again, the result of crossing a four-toed breed of bird —e.g., game—with a five-toed breed (Dorking or Chinese silky fowl) was the production in the first generation of birds, which mostly had five toes. Some of them, however, were *odd-toed or asymmetric, having five toes on one leg and four* on the other. Mr. Bond showed a photograph of a pheasant which was male on one side and female on the other, with a well-developed spur on the male side. He pointed out that the influence of the cross-breeding—i.e., the introduction of the factor or controlling influence for the extra digit in fowls—might extend in later generations to the other toes, and might bring about an irregular development of claws both in the toes and at the end of the wing bones.

Other examples were drawn from the result of the marriage of a person with large ears with well-developed "lobes," with another person with small ears and scanty ear lobes; the children showed both types of ear pattern, and in one individual an asymmetric pattern on the two sides of the head. The same thing was apt to happen with the colour of the eyes in man and animals.

The conclusion was reached that hemilateral asymmetry *was closely associated with previous cross-breeding*. The process by which the asymmetry of eye colour, or ear shape, or horn curve, was brought about was essentially one of segregation or differentiating cell division. This, in the case of Mendelian segregation, took place among the germ cells which, on fertilisation, gave rise to individuals having different genetic characters; whilst, in the case of asymmetry in the same individual, the cell differentiating process was concerned with the multiplication and growth of the body cells at that stage of embryonic development when the bilateral plan of growth was laid down in the growing embryo. Since eugenic progress along sound lines must rest on genetic knowledge, Mr. Bond hoped that the study of asymmetry or dissimilarity in the individual, like the study of dissimilarity among individuals, would lead to further progress along genetic lines.

HOME TREATMENT OF PANEL PATIENTS.

AT an inquest on a man of 40, who died from lobar pneumonia after a few days' illness, the Shoreditch coroner, Dr. Edwin Smith, made some comment on the treatment which he had received. According to the account in the daily press the patient, who was a porter employed at the Shoreditch Working Men's Club, visited his insurance doctor's surgery, and, after receiving medicine, was advised to go home to bed. He called at the surgery six days later; he was visited at home by his doctor, who then sent him to St. Leonard's Hospital, where he died on the following day. Dr. Smith's reported remarks are as follows:—"One feels that he ought to have been recognised as being a very sick man. There is far too much of this sort of thing—'Go home and let me know how you are getting on.' Speaking generally, the home treatment of panel patients who are not well enough to go to the surgery is very inadequate. Too often it is a case of '*Go home and come back again when you are better.*' If in the interval the man gets worse and dies, a death certificate is issued and nobody hears of the case."

Dr. C. L. Batteson, secretary of the London Panel Committee, who was present at the inquest, remarked that *to say that the home treatment was inadequate* was a sweeping statement. He asked whether the coroner intended it to apply generally, or only to this particular case. Dr. Smith replied that there were many cases which did not come to the surface where patients were sent home with the message: "Come and see me again when you are better." What the exact percentage of the cases was in proportion to those who had adequate treatment, he was not prepared to say. Later on he added: "I want to be fair, I will modify my statement that, speaking generally, they do not get adequate home treatment . . . But too many of the cases are not followed up at home, and the patient is allowed to muddle along."

We have now received from Dr. Batteson a copy of a resolution passed by the London Panel Committee at its meeting on April 23rd:—

> "That the Panel Committee for the County of London learns with regret the remarks passed by Dr. Edwin Smith at a recent inquest with regard to home attention given to insurance patients in general, and is of the opinion that the coroner had not in his possession any evidence which would warrant such a statement. The Panel Committee considers such unfounded remarks extremely unfortunate as being likely to prejudice the good relations at present existing between insurance practitioners and their patients."

It is presumed that the coroner was speaking of matters which have come under his experience in the particular neighbourhood, and it will be noted that he has already disclaimed any wider application to panel practice in general, but his remarks about the inadequacy of home treatment by insurance practitioners have been given wide publicity, and confidence can only be restored by the knowledge that complaints of this kind are always investigated by the Medical Service Subcommittee of the local Insurance Committee. No doubt this practice will be followed in the present instance.

SYNTHETIC DRUGS.

Mr. Francis H. Carr gave an address on this subject at a meeting of the British Science Guild at the Mansion House, London, on April 24th.

Medical treatment, he said, had become increasingly dependent on the use of substances prepared by chemical synthesis, and to-day in Great Britain the important manufacturing firms were between them making most of the synthetic drugs. The exceptions, which included guaiacol, phenacetin, and veronal, were chiefly substances derived from intermediates employed in the making of dyestuffs, and such substances could be more cheaply produced by the dye manufacturers. The advantages of rationalisation in the fine chemical industry, by interconnecting and rearranging the various branches in order to secure efficiency and the best development, at once became apparent when it was realised that most of the substances manufactured required specialised plant and accumulated experience.

Future progress lay in extending the use of science, in the first place by promoting research in industrial laboratories in the closest possible relationship with that carried out in academic institutions and under the ægis of the Medical Research Council; and, secondly, by finding employment for greater numbers of scientifically trained staffs and workers to whom was given responsibility and a living interest in the work they were performing. Fortunately there had been a great increase during the past decade in the number of men receiving university training in chemical science It was also of great importance that youngsters on leaving *secondary schools at the present day had had sufficient* grounding in elementary science to discover if they had an aptitude for it. These youths on entering industrial laboratories in the chemical industry received some sort of tutelage and practical training by day, and they supplemented this by attending technical colleges by night. In this way a rank and file of able workers was being produced and many new opportunities were opening out for them.

A NEW SIGN OF MEASLES.

Dr. Géza Petényi, lecturer in the University of Budapest, has recently described in the *Orvosi Hetilap* a manifestation of measles which, he says, has not been mentioned hitherto in medical literature. It consists of small dot-like hæmorrhages which appear in the prodromal stage on the buccal mucous membrane at about the same place where the Koplik spots develop, and also on the soft palate. The number of hæmorrhagic dots on the buccal mucous membrane is small, from three to eight; on the soft palate are usually more, in one case 20. The dots develop from one to three days before the Koplik spots and last for two or three days. When they present themselves the buccal mucous membrane is still normal, and the punctate hæmorrhages are therefore distinct. Petényi says he has had the chance of observing a good many cases of measles during the incubation period; in about half of them the phenomenon was distinctly visible and always at the same stage of the disease, and in the same clinical form, so that it could not possibly be accidental, and must be regarded as a regular attendant phenomenon of measles. He does not want to draw any far-reaching conclusions about the symptom. On the one hand, it occurs in the earliest stage of the disease; on the other hand, hæmorrhages in the buccal mucous membrane may be provoked by different processes. Not even Koplik spots make it quite certain that the case is one of measles. Why these dot-like hæmorrhages should be seen in about half of the cases, and not always, Petényi cannot explain; just as, he says, we do not know why in certain cases the Koplik spots or the pre-exanthem are conspicuous by their absence.

THE PRICE OF INSULIN.

THE British Drug Houses, Ltd., and Allen and Hanburys, Ltd., announce that the price of "A.B." Insulin is to be reduced from 2*s.* 8*d.* to 2*s.* as from next Friday, May 10th.

X.Y.Z.—Dr. Horsley Gantt's translation of Pavlov's papers on Conditioned Reflexes, to which a leading article was devoted two weeks ago, is published by Martin Lawrence, 26, Bedford-row, London, W.C.1, at 18*s.*

THE Burroughs Wellcome & Co. West End Exhibition Rooms have been transferred from 54, Wigmore-street, London, W.1, to larger premises at 10, Henrietta-street, Cavendish-square, London, W.1.

Oliver-Sharpey Lectures

ON THE

PHYSIOLOGICAL ANALYSIS OF SOME CLINICALLY OBSERVED DISORDERS OF MOVEMENT.

Delivered before the Royal College of Physicians of London

BY F. M. R. WALSHE, M.D., D.SC. LOND.,
FELLOW OF THE COLLEGE; PHYSICIAN-IN-CHARGE OF THE NEUROLOGICAL DEPARTMENT, UNIVERSITY COLLEGE HOSPITAL, AND PHYSICIAN TO OUT-PATIENTS, THE NATIONAL HOSPITAL, QUEEN-SQUARE.

LECTURE I.

(Delivered on April 30th, 1929.)

IT is characteristic of disease of the nervous system that it shows itself by disorders of function in non-nervous tissues innervated by this system rather than by those local manifestations that accompany disease of other organs and tissues in the body. Therefore an important part of the task of the neurologist is to localise the disease process in the nervous system by the analysis of disorders remote from it. Since within the nervous system there is a degree of local differentiation of function unparalleled in any other tissue, clinical neurology is more essentially the study of applied anatomy and physiology than is any other branch of clinical medicine.

It is on this account that the neurologist finds his most fascinating problems in the physiological interpretation of the symptoms of structural nervous disease; in other words, in the endeavour to deduce the normal functions of the various parts of the nervous system from an analysis of the disorders in function produced by disease.

THE NATURE OF THE PROBLEM.

In dealing with the problem thus stated, neurological thought is largely influenced by certain well-known abstract generalisations. Some of these have proved weapons of the greatest value, but a common tendency to invest them with the quality of dogmas has too frequently led to a subordination of the facts of observation to the exigencies of theory, and to a corresponding neglect of that rigorous correlation of clinical and experimental observation that is essential to a truly physiological analysis of symptoms.

Hughlings Jackson's Theory.

There can be no better illustration of the double-edged quality of the abstract conception, when applied to the interpretation of symptoms, than is provided by Hughlings Jackson's theory of the evolution and dissolution of function within the nervous system. This conception, formulated before this College in his Croonian Lectures of 1884 by Jackson[3] has been widely adopted as a guiding principle in the interpretation of nervous symptoms, and often with the most striking results. Yet from the facts that the various papers in which Jackson developed his views are for the most part hidden in the bound volumes of extinct medical journals, and that no modern and complete restatement of these views has been attempted, many of those who adopt them know no more of them than is contained in those fragmentary and often misleading citations that are passed on from writer to writer. This fact, and the abstract nature of the conception in question, have made its application to the complex problems of clinical neurology no easy matter, while its misapplication has proved a stumbling-block to many seekers after knowledge. An excellent illustration of these difficulties is provided by the oft-quoted statement that "tremor is rigidity spread out thin." The phrase has become a shibboleth that all who approach a consideration of the relationship of tremor to rigidity must fain utter, though to do so paralyses clear thinking on the subject, since the distinction between tremor and rigidity is clearly one of kind and not one of degree.

Further, even for those who are not led captive by an aphorism, there remain pitfalls in the application of Jackson's hypothesis. Thus a common source of error has been the assumption that a symptom, be it one of release or of loss of function, represents the opposite of the disordered function. In the case of certain lesions such a simple interpretation may be valid. But in the great majority of brain lesions the assumption leads to a confusion between symptoms and functions that, as von Monakow has insisted, has been one of the most fruitful sources of error in the determination of cerebral functions. A few illustrations from current neurological beliefs will make this clear.

Thus the development of tremor in paralysis agitans has been attributed to the involvement by disease of a hypothetical tremor-inhibiting centre, the fatigue shown by the subject of cerebellar ataxy to the loss of a reinforcing action of the cerebellum upon muscular contraction; while the tendency of such a subject to overshoot the mark (dysmetria) is said to indicate the loss of a normal "braking" action of the cerebellum upon the same function.

It is surely obvious that ad hoc interpretations of this order are remote from reality and can tell us nothing, yet to such elaborate lengths have they been carried within recent years in the case of the corpus striatum that their absurdity is at last becoming manifest, and in the inevitable swing-over of opinion most of the imaginary "functions" which have been bestowed upon the basal ganglia with such artificial precision are now being denied to them.

The Appeal to Phylogenesis.

Secondly, there is the appeal to so-called phylogenetic considerations in virtue of which certain release symptoms are alleged to be reversions to forms of nervous activity characteristic of earlier phylogenetic stages in the evolution of the nervous system. These "primitive" reactions are supposed to lie latent beneath an age-long, permanent inhibition, but at the releasing touch of the process of dissolution of function are ready to spring into their pristine activity.

Thus, in the mobile spasm of athetosis we are asked to recognise the tree-climbing activities of our ape-like ancestors,[2] in the flexed posture of the hemiplegic arm the normal resting attitude of the simian forelimb,[6] while according to Rivers[7] protopathic sensibility and the "mass reflex" of spinal man represent the normal sensori-motor endowments of some hypothetical primitive animal.

The fascination of these wanderings into the realms of fantasy probably lies in the fact that phylogenetic speculations are as difficult of refutation as they are incapable of proof.

> "It is easy," as Karl Pearson remarks in his 'Grammar of Science,' "to replace ignorance by hypothesis, and because only the attainment of real knowledge can in many cases demonstrate the falseness of hypothesis, it has come about that many worthy and otherwise excellent persons assert an hypothesis to be true because science has not yet by positive knowledge demonstrated its falsehood."

All that has been learned from the actual observation[5] of the elementary nervous system in the lowest forms of animal life to possess differentiated nervous tissues shows it to be an instrument of precision from its first appearance and to be entirely lacking in those "elements of vagueness and confusion" postulated by Rivers for his figment the protopathic animal. Nor has the less profoundly remote reference to our ape-like ancestors any internal corroboration. We shall consider later the view that the spasticity of hemiplegia is a form of hypertonus physiologically related to Sherrington's decerebrate rigidity. In the latter condition both fore and hind limbs are in rigid extension, while in man the spastic arm lies flexed. With the factors determining this anomaly I hope to deal later, but it has been suggested that this flexed posture represents the normal resting position of the simian forelimb, to which the human arm reverts on release from cortical control.

Of the extremely unreal character of this hypothesis we may gain a glimpse from the behaviour of the decerebrate sloth. This member of the Edentata differs profoundly in its mode of life from its immediate relatives in the animal world, and indeed from all other mammals before and after it in the evolutionary scale, in that its life is exclusively arboreal. The sloth spends its life in the supine attitude suspended by its flexed limbs from the branches of trees. Placed on the ground it is helpless. According to Richter and Bartemeier [6] "it is scarcely able to raise its body from the ground and literally has to drag itself along."

If reversion to type, or to prototype, were characteristic of the release symptom surely the decerebrate sloth should become rigid in extension and display the unmasked elements of a locomotor activity more in consonance with that of the order to which it belongs, and that of the forbears from which it has come. Yet the decerebrate sloth is rigid in flexion and continues to hang reflexly from the bough.

This naïve form of appeal to phylogenesis, then, has nothing in common with what was understood by Jackson in his conception of "internal evolution," and is, indeed, nothing but a revival of a mode of thought that dominated medicine in Germany in the early days of last century. In his book "Nosography in Modern Internal Medicine," Faber, in referring to this period, observes that—

> "Karl Hoffmann, influenced by certain ideas in Schelling's 'Naturphilosophie,' described in his 'Ideal Pathology' the various morbid conditions as a kind of retrogression to lower stages of evolution. Rickets signified a return to the mollusca because the bones became soft. He thought individuals suffering from certain digestive disorders had descended to the rank of cattle. That the tongue got white, the urine sedimented, and eructation and vomiting occurred—all indicated a tendency to rumination. A finer example of false analogy can hardly be adduced."

It is apparent, therefore, that our employment as guiding principles of abstract generalisations must constantly be controlled by careful reference to the progressively increasing body of observed phenomena. We must not hesitate to modify or to reject whatever will not stand this reference. We pay but lip service to the masters of a past generation when we exalt their lightest epigrams into axioms that none dare question, and their generalisations into fundamental truths by which all new facts of observation must be assessed.

If we look back upon the past 50 years of neurology in this country we see that the period opened with a close and brilliant association between clinical and experimental investigation, an association maintained for many years and depending upon the fact that clinical and experimental methods were often pursued by the same investigator. Ferrier, Horsley, Beevor, Page May, and Risien Russell were among the outstanding examples of this fruitful combination. Within recent years the collaboration between these two methods has been less close. The hewing out of the main features of neurophysiology by relatively simple experimental methods has given place to the minute analysis of fundamental nervous processes by methods of great complexity. Clinical and pathological problems have become correspondingly difficult and exacting, and a single individual can no longer easily pursue knowledge by all three paths.

Nevertheless, we must admit that the divorce has been most unfavourable to advance by the two latter methods, clinical and pathological, in so far as the *interpretation* of symptoms is concerned. This is illustrated by the barrenness of nearly twenty years of intensive study of the functions of the basal ganglia by these unaided methods. Even in the case of the sensory system, it required the experimental method in the hands of Head and Rivers, Trotter and Davies before the chief factors in cutaneous sensibility could be elucidated. We may say, then, that whatever success has attended clinical studies in the interpretation of the symptoms of nervous disease has been proportional to the degree in which these studies have been inspired by physiological principles, and to the extent to which—within the narrow limits possible in clinical medicine—the precise methods of experimental physiology have been applied.

We may finally attempt to formulate in terms of physiology those aspects of Jackson's theory that are relevant to the specific problems of symptom interpretation that we are to consider.

Three Physiological Levels.

We may distinguish some three physiological levels of function within the nervous system. The *lowest level* is subserved by the afferent and efferent neurones of the segmental nervous system. It is fully organised from birth and has a well-defined range of activities which are not capable either of variation or of amplification during life. On this level is achieved the simple coördination of muscular movement; coördination *by* reflex action and a higher grade of coördination *of* reflex reactions. These reactions include the spinal phasic reactions, and the stretch reflex which is the basis of posture, and also various tonic and phasic reactions described by Magnus and de Kleijn which have their centres in the brain-stem. In short, the function of this level is the coördination of movement and posture.

The *middle level* comprises anatomically the projection system neurones of the cerebral cortex, and possibly those of the basal ganglia. These secure a re-representation of the activities already enumerated, but a more highly differentiated and integrated representation. The function of this level has been shown by Sherrington and Grunbaum to consist in the analysis, or fractionation, of the relatively large movements subserved as reflex reactions by the lowest level, and the synthesis of numerous fractions into a vast number of combinations and sequences of movements and postures that constitute the normal range of voluntary motor activities of the individual.

Finally, we have the highest level consisting of yet another still more complex and differentiated representation of these activities. Under the guidance of the distance receptors this level achieves the final integration of the organism and its adaptation to its environment, using this term in its broadest sense. The middle and highest levels are incompletely organised, or evolved at birth and are capable of a high grade of evolution, or education, during the life of the individual. This is the process spoken of by Jackson as "internal evolution," to the wide range of which in the human brain man owes the differences between himself and the lower animals. It is to be noted that phylogenetic considerations do not figure in Jackson's hypothesis, though he observes that "evolution starts with 'things given' by inheritance."

The effect of disease is to take this physiological hierarchy of levels to pieces from the top; the most recently acquired, most highly specialised and least deeply impressed elements of function suffering earliest and most severely. Since, when death does not ensue, this process of dissolution is incomplete, the earlier acquired, less highly specialised and most deeply impressed elements of function remain and, released from higher control, proceed to overact and to produce what he speaks of as "positive symptoms." Thus nervous disease has a dual symptomatology, there are functions lost and functions released. In the loss of voluntary movements on the one hand, and in the spasticity, clonus, and associated movements on the other, we have in a case of residual hemiplegia the representatives of these two groups of symptoms.

It is in dealing with disturbances at relatively high levels of nervous activity that we see most clearly exemplified these principles of dissolution of function. On the other hand, loss of function restricted to some single component of relatively low physiological level produces a disturbance of function that affects all levels, higher and lower alike. A striking illustration of this is provided by cerebellar ataxy, a disorder of movement that represents an algebraical summation of the activities of all the components of movement remaining after the falling out of the cerebellar component. In voluntary movement we have the cerebral motor cortex activting an unbalanced lower level mechanism, and the result may be regarded as *a general reaction* on the part of a mutilated motor mechanism, a reaction from which we cannot identify the *individual contributions of each active component*, nor deduce the normal functions of the lost cerebellar component. From simple observation, however careful, it has proved impossible to decide precisely what is lost and what released. The crude interpretations of cerebellar ataxy that still pass muster for essays in physiology in neurological literature are the fruit of a neglect to realise the origin and nature of the general reaction, and result in serious errors in the application of Jackson's hypothesis of dissolution of function.[12]

Of the two specific symptom-complexes now to be considered in detail, one—that of spastic paralysis—is an example of dissolution in which the principle of loss and release of function is illustrated; the second, that of paralysis agitans, on the other hand, will be considered as an example of the general reaction.[7]

Having thus stated the nature of the problem and the method it is proposed to adopt in dealing with it, we may now take these two specific symptom-complexes and attempt such physiological interpretation of them as is possible. We shall also consider the relationship obtaining between the spasticity of the former condition and the muscular rigidity of the latter.

THE SYMPTOM-COMPLEX OF SPASTIC PARALYSIS.

Characteristic examples of this are provided by *spastic residual hemiplegia* and by *spastic paraplegia* in extension. An essential factor in its production is some interference with the functions of the pyramidal system of neurones, which we may assume in man to be the sole cortico-spinal pathway for the production of voluntary movements.

The essential elements *in spastic paralysis* may be summarised as follows: (*a*) There is a selective impairment or loss of voluntary movements. In the case of the limbs, with which I am mainly concerned, the incidence of loss is, in order of severity—in the arm all skilled and isolated movements of the hand and digits, extension of wrist and digits, supination of the forearm, abduction and elevation of the upper arm; in the leg dorsiflexion of foot and toes and flexion at the proximal joints. (*b*) The release phenomena include muscular hypertonus, or spasticity, the so-called "associated movements," and other tonic reactions of labyrinthine and muscular origin, the phenomenon of clonus, increased tendon-jerks, and the appearance of the flexion reflex of the lower limb with its component, the Babinski plantar response. It is with the physiological significance of these release phenomena that I propose chiefly to deal.

1. *Spasticity, or Hypertonus.*

Like the loss of voluntary movements, spasticity has a *selective incidence*. Thus in hemiplegia, in the upper limb it is maximal in the flexors of wrist and digits, the flexors and pronators of the forearm, and the adductors of the upper arm. It is usually absent from the extensors of wrist and digits. In the lower limb it is maximal in the plantar flexors of foot and toes, in the knee extensors, and in the thigh adductors. This distribution of hypertonus results in an attitude *of flexion and adduction* in the arm, and one of extension with (plantar flexion) and adduction in the leg.

The quality of this spasticity is most easily determined in the knee extensors. If, with the patient lying supine, we support the thigh in the left hand *and grasp the leg above the ankle with* the right, we find on attempting to flex the knee that the initial five to ten degrees of flexion can often be carried out without resistance. When this limit is passed the muscle develops tension, and opposes a resistance of varying intensity to further stretching over about another thirty degrees of flexion, when the resistance suddenly melts and disappears. *From* this point flexion can be readily completed. It appears that stretch of quadriceps has set up a tonic contraction, which is in turn inhibited if further stretch be imposed. This is the phenomenon known to clinicians as the "clasp-knife phenomenon" and *is characteristic of spasticity.*

Further, stretch of quadriceps effected in this way is sometimes accompanied by a striking reaction in the quadriceps of the crossed leg in cases of spastic paraplegia in extension. If before carrying out the procedure described above the crossed leg is passively flexed and lightly supported by an assistant, we find that passive stretch of quadriceps is accompanied by shortening in the crossed (and previously stretched) quadriceps, and the flexed leg moves into extension. In other words, stretch and inhibition of tonus in one quadriceps evokes reflex tension and shortening in its fellow. For the moment I will refer to this crossed reaction as Phillipson's reflex and defer its interpretation until later.

2. *Clonus.*

Associated with and due to sudden stretch is the phenomenon of clonus, most readily elicited in the way familiar to clinicians in quadriceps and gastrocnemius-soleus. It is a phenomenon peculiar to the spasticity of pyramidal system lesions. In the leg, clonus is elicitable from extensor (including plantar flexor) muscles and is of common occurrence. In the spastic arm, however, clonus is relatively uncommon and when seen occurs in the wrist flexors. The probable significance of this altered incidence will be discussed later.

Another characteristic feature of spasticity is the readiness with which it may be transiently overset, or inhibited, by intercurrent phasic or movement reflexes of cutaneous origin. Thus, pricking or pinching the skin of the spastic leg or foot over a field of varying extent elicits a rapid and sometimes ample and forceful reflex contraction of the limb *flexors (and dorsiflexors).* *In cases of extreme* extensor spasticity it may be necessary to make use of this flexion reflex to overcome the hypertonus and thus allow of passive flexion of the limb.

3. *Associated Reactions.*

These reactions are more familiar to clinicians under the title of "associated movements." They consist in slowly developing, forceful accesses of hypertonus into certain muscles of the already spastic limbs, the arm more especially, which lead to the adoption of new postures by the limb. They are evoked by such semi-involuntary movements as yawning and stretching, and also by any forceful, sustained voluntary contraction of muscles on the normal side in cases of hemiplegia. Thus, during a yawn the hemiplegic arm slowly rises up in front of the chest, the wrist extends, and the digits extend and fan. This new posture is maintained as long as the yawning movement and dies with it. The common associated reaction on purely voluntary movement is increased flexion and adduction of the arm, with either flexion or extension of the leg. Of considerable importance in the interpretation of these familiar reactions is the manner in which they can be varied in form by reflex influences arising in the labyrinths and in the proprioceptors of the neck muscles.

For example, if the standing hemiplegic subject look straight before him and clench the normal fist, the spastic arm which has been lying adducted and slightly flexed at the elbow moves slowly into increased flexion at elbow, wrist, and digits. If we repeat this procedure, with the patient's head rotated towards the hemiplegic side, the spastic arm now *moves slowly into extension* and abduction, the fist remaining closed. If we repeat the procedure a third time, the patient's head now being rotated away from the hemiplegic side, the spastic arm moves slowly into increased adduction and flexion.

Again, in a proportion of cases of hemiplegia, active rotation of the head towards the hemiplegic side against resistance is sufficient to evoke a slow involuntary extension and abduction of the affected arm, while rotation away from the affected side is followed by slow flexion and adduction. This variation in associated reactions on head rotation, and also the reactions resulting from head rotation alone are modifications in muscle-tone produced reflexly by stimuli arising in the proprioceptors of the neck muscles when the position of the head in relation to the trunk is altered.

Similar modifications may be produced by altering the position of the head in relation to the horizontal plane of space.[11] In this case the otolith organs of the labyrinths are the reflex source of the variations. We see, then, that the spasticity of the hemiplegia may be influenced, and the limbs thereby induced to take up new postures by proprioceptive stimuli arising in the labyrinths, in the neck muscles, and in the limb muscles. We may state at once that these reactions belong to the group of tonic reflexes described by Magnus and de Kleijn in the decerebrate animal.

One other feature of spasticity remains to be mentioned. *It is abolished by posterior root section, and* also by intramuscular injection of novocaine in such strengths as paralyse conduction in the sensory nerves only of the muscles—that is, by de-afferentation of the spastic muscle. It is, therefore, a reflex reaction arising by the stimulation of sensory receptor organs in the muscle itself.

To summarise: the features of spasticity of pyramidal lesions are selective incidence; reaction to sudden stretch by tendon-jerk and clonus; reaction to slight increasing stretch by increasing tension, and to further increase of stretch by inhibition, this degree of stretch often invoking increased tension and shortening in the crossed knee extensor (Phillipson's reflex); the presence of tonic reflexes arising in labyrinths, neck, and limb muscles; and ready inhibition by intercurrent phasic reflexes (e.g., the flexion reflex). One other type of release symptom remains to be considered.

4. *The Flexion and Crossed Extension Reflexes: the Babinski Response.*

The Babinski plantar response may be called the hall-mark of pyramidal system lesions. Examination of this response reveals that it is but an integral part of a general flexion reflex of the limb, which includes flexion at hip and knee and dorsiflexion of feet and toes—more particularly of the hallux. Moreover, in well-developed spastic paresis the receptive field of the reaction includes the skin and deep structures of the foot and distal parts of the lower limb. Further, it may be accompanied by a reflex extension of the crossed leg in cases of paraplegia. If the crossed leg is already lying in full extension this movement is restricted to plantar flexion of the foot and great toe (the "crossed plantar response" of clinical observers), but if it be passively flexed prior to stimulation of the crossed sole the whole limb may move rapidly and powerfully into extension. The detailed description of these two reflexes as they occur in man has been given elsewhere[9] and need not be repeated here. They are amongst the most beautiful examples of release of function known to the clinical observer.

THE INTERPRETATION OF THE SYMPTOM-COMPLEX.

The phenomena thus briefly described fall into two groups. Spasticity with its various modifications under diverse influences belongs to the group of sustained or tonic muscular reactions, whilst the flexion and crossed extension reflexes (with their component Babinski and crossed plantar responses) belong to the group of movement, or phasic, reactions. The physiological relationship between the two last-named reactions and the reflexes of the same name described by Sherrington is so evident that we may at once accept them as expressing the release of these spinal reflexes on the abrogation of cortical control.

Passing now to the consideration of spasticity and its associated phenomena, we find in them also a remarkable resemblance to the tonic reflexes which make their appearance in the decerebrate preparation—that is, in such an animal as the cat, after transection of the brain-stem at the intercollicular plane. The extensor hypertonus which develops after this procedure, and is known as decerebrate rigidity, is now so familiar in its general outlines that no detailed description of it is required here, but we may emphasise that its origin as a proprioceptive reflex which is abolished by de-afferenting the tonic muscle, its selective incidence in a physiological group of the musculature, its modification by labyrinthine and muscular afferent impulses with the production of Magnus and de Kleijn's "righting" and other tonic reflexes, and finally its relations to intercurrent phasic reflexes are features which we have found in pyramidal spasticity in man.

A somewhat closer examination of certain features of decerebrate rigidity is necessary to establish more completely the physiological identity of these two *groups of phenomena, animal and human.*

The first of these is the *nature of the stimulus*, which provokes the tonic muscular response. We have seen that in both instances this arises in the muscle itself, the integrity of whose afferent supply is therefore essential. Liddell and Sherrington[4] have shown that stretch applied to the muscle is the normal stimulus. To this the muscle responds by shortening, or, if this be prevented, by the development of tension which persists for as long as stretch is maintained. Muscle tone, therefore, is a stretch reflex.

The nature of the tonic contraction thus set up by afferent impulses in a varying number of stretch receptors in the muscle itself consists in asynchronous contractions of individual muscle-fibres at a relatively slow rate. A sudden series of synchronous afferent impulses, such as may be produced by a tap on the tendon, produces a synchronous volley of efferent impulses from the motor neurones concerned which results in the production of a tendon-jerk, and in certain circumstances in that of clonus.

The relative non-fatigability of the tonic response depends upon the asynchronous nature of the response in the individual muscle-fibres, and upon the fact that the focus of the effector muscle units consists of the relatively slowly contracting, fatigue-resisting red muscle-fibres.

The actual mechanism of the response in the individual fibre is the ordinary one seen in all muscular contractions, and is not a function of sympathetic innervation, but of ventral horn cell activity.

The Lengthening Reaction.

If a muscle already engaged in slight tonic contraction in response to stretch be passively lengthened, its initial response is the development of increased tension, but as lengthening is continued this response is inhibited, the tonic contraction ceases, and the observer who is manipulating the limb feels the resistance of the muscle melt and disappear. At the new and greater length equilibrium between excitation and inhibition is again reached and the muscle resumes its tonic contraction.

The Shortening Reaction.

If the two ends of the tonic muscle be passively approximated, and the muscle allowed to take up a new and shorter length, it is again found to resume tonic contraction at its new and shorter length, and to preserve the new posture thus passively imposed upon it.

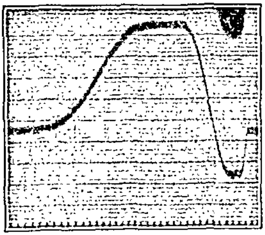
This reaction also is a manifestation of the stretch reflex. For as the muscle is passively shortened the stretch receptors cease to be stimulated, but if the limb be now released its weight tends slightly to stretch the shortened muscle, the stretch receptors are again stimulated, and the tonic response begins again. Even if this release of the limb be not allowed to occur, the stretch receptors adapt themselves to the new length and are again stimulated, the normal anatomical attachments of the muscle providing the necessary tension. Both lengthening and shortening reactions, therefore, are manifestations of stretch reflex activity, and are the basis of the capacity of the limb musculature to maintain a wide range of postures. Denny-Brown[1] has adduced evidence for believing that the tendon organs of Golgi, which are found throughout the muscle in relation with the aponeuroses, are the stretch receptors.

We are now in a position to identify the familiar "clasp-knife" phenomenon, described earlier, as an expression of the lengthening reaction in the spastic muscle. Yet another manifestation of stretch reflex activity in the spastic muscle is the reflex mentioned earlier as Phillipson's reflex. This consists in tonic shortening of one quadriceps when its fellow of the opposite limb is submitted to stretch and shows the lengthening reaction.

The Knee-jerk.

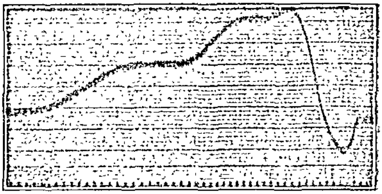
In the spastic limb this reflex presents features which are found to be characteristic of the decerebrate knee-jerk. Pritchard, working with an improved method, in a careful study of the human knee-jerk finds that on the curve of relaxation of the spastic jerk is a "hump," or tonic rebound identical in form and time relationships with that of the decerebrate jerk. (Figs. A and B).

FIG. A.



(A) Graphic record of normal knee-jerk, showing steep ascent, plateau, and uninterrupted descent.

FIG. B.



(B) Graphic record of typical spastic knee-jerk, showing steep ascent, plateau, and "hump" or tonic appendage, on course of relaxation curve.

Both records are to be read from right to left. The initial descent indicates the sudden depression of the patella which constitutes the stretch stimulus. Time-marker strokes shown at the bottom of the figure correspond to 0·01 sec. Both records were obtained by Dr. E. A. Pritchard, to whom I am indebted for them, by a method devised and shortly to be described by him.

Clonus.

In clonus we have another characteristic feature of both spasticity and decerebrate rigidity. It is a response to sudden and maintained stretch, the rhythm of the response being due to alternating predominance of excitation and inhibition.

The Distribution of Hypertonus.

It is in this matter that we meet the only striking difference that obtains between experimentally produced hypertonus and that found in spasticity in man, as we see it in a residual hemiplegia. In the former the incidence of hypertonus is in the extensor of both fore and hind limbs. In man, the leg alone is spastic in extension, the arm invariably becoming spastic in flexion.

Various hypotheses have been put forward by those who accept the physiological identity of decerebrate rigidity and spasticity to account for this difference, but before we can consider them we must discuss the factors which appear to determine the extensor incidence of decerebrate rigidity. Denny-Brown[1] has produced evidence to show that there exist in the limb extensors of the quadruped a large number of effector units (muscle-fibre groups) which have an extremely low threshold of stimulation for the stretch afferents. These low threshold units are composed of the slowly contracting red muscle-fibres. Higher threshold units are composed of more rapidly contracting pale muscle-fibre units. Thus in the complex muscle gastrocnemius-soleus, soleus is a red fibre-muscle, gastrocnemius a pale fibre muscle. A similar division of complex muscles into red and pale muscle-fibre heads is found elsewhere in the body. The low threshold red muscle units form the motor focus of response in the stretch reflex.

Various central influences, such as the labyrinthine and other tonic influences described by Magnus and de Kleijn, still further lower the threshold of excitation of extensor motor neurones, affecting the flexor neurones reciprocally. There exist also in the brainstem, caudal to the intercollicular plane, other sources of predominantly extensor neurone excitation. It is the release of these centres by decerebration, as well as the low stretch-excitation threshold of extensor spinal motor neurones, which determine the extensor distribution of the hypertonus in decerebrate rigidity.

In the limb flexors, on the other hand, there exist comparatively few effector units of low threshold to stretch excitation, and the subsidiary adjuvant sources of excitation mentioned above do not play ordinarily upon the flexor motor neurones. Hence the stretch reflex—that is, tonic contraction—is characteristically a mode of activity of extensor muscles, and there can be no doubt that this functional arrangement is related to the maintenance of the normal quadrupedal posture of standing. We see, therefore, that muscle tone of normal intensity and decerebrate rigidity are essentially the product of spinal neuromuscular mechanism, upon which higher level nervous mechanisms tend to exert a selective and mainly inhibitory influence. Hence release from these higher levels leads to the development of hypertonus.

The Flexed Arm of Hemiplegia.

To account for the flexed arm of hemiplegia we must assume that there has been a functional re-setting of the spinal neuromuscular mechanism, by which the flexor motor neurones have become predominantly responsive to stretch excitation. In the human lower limb we still have a "locomotor prop" whose functions have undergone no alteration with the assumption of the erect posture, and whose extensor motor neurones still remain the chief stretch effectors. On a priori grounds it is not unreasonable to suggest such a functional rearrangement for the human upper limb. It no longer supports the body and an extensor distribution of stretch reflex activity in it has lost its primary purpose. The arm hangs from the shoulder and supports nothing, and in this position the flexors are more constantly submitted to stretch than the extensors. In this connexion it is interesting to note that clonus, one of the most characteristic expressions of stretch reflex activity is a function of limb extensors in the human lower limb, but when found in the spastic arm occurs in the wrist flexors.

We may therefore suppose that the altered relation of the human arm to the postural function has determined a rearrangement of the neuromuscular mechanism of the stretch reflex which is more in consonance with the functions of the arm than an extensor distribution would be. We have seen in the case of the sloth that such a rearrangement has occurred in all four limbs in accordance with their habitual functions, and this in response to the mode of life of the sloth itself and not in relation to its phylogenetic associations.

The interpretation thus developed of the flexed arm in hemiplegia is in accord with physiological principles, has precedent, and does not involve an appeal to phylogenetic analogies. I have earlier referred to the view that the flexed arm represents the resting position of the simian forelimb. Russell Brain[8] who has advanced this view, further states that if the hemiplegic subject leans forward so far that he has to support the trunk to avoid falling—that is, if he mimics a quadrupedal posture—the flexed arm at once goes into strong tonic extension with the forearm pronated and the wrist and digits flexed. In the resemblance which he notes between this attitude and that taken up by the forelimb of the chimpanzee when supporting its trunk on its forelimbs, he identifies an "extensor quadrupedal reflex." He regards the presence of this tonic extension as further proof of his contention that the flexed arm represents the resting position of the chimpanzee's forelimb. Here we seem to have another false analogy. Further, I have never been able to elicit this extensor reflex in the spastic hemiplegic, so that it must be a very rare and inconstant phenomenon. Moreover, in the photographs with which Brain illustrates his argument the subjects presenting extended arms are not in the supported position he describes as essential to its elicitation. We may, therefore, dismiss this hypothesis as unacceptable both clinically and physiologically.

CONCLUSIONS.

From the admittedly brief and incomplete account given of decerebrate rigidity it becomes clear that the spasticity of hemiplegia is physiologically identical with this condition, while for the altered state of the arm reasons have been adduced which do not run counter to known physiological principles and involve no speculative appeals to phylogenesis.

It is, of course, obvious that the condition of hemiplegia is but a fractional expression of decerebrate rigidity, and that a condition approximating to the experimentally produced one must be extremely rare. Nevertheless, a few examples have been recorded in neurological literature and elsewhere[13] I have fully described such a case in which, so far as was clinically possible of verification, all the features of decerebrate rigidity were present in a comatose patient with double hemiplegia resulting from compression of the brain-stem by a tumour. Moreover, it is clear that the release of the spinal reflex mechanism responsible for muscle tone may result from lesions at any anatomical level from cerebral hemispheres to cord, provided that the appropriate descending paths be interrupted. Hence in man we have in spastic paraplegia in extension a condition of extensor hypertonus in the legs presenting the same physiological characters as we find in the spastic leg of the hemiplegic.

In the case of spastic paralysis, therefore, we are able to reach a physiological interpretation of numerous physical signs which cannot be generalised on any other basis than that we have adopted.

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JUVENILE BEHAVIOUR DISORDERS IN EPIDEMIC ENCEPHALITIS.

THEIR TREATMENT BY BULBOCAPNINE.

BY T. R. HILL, M.B., M.R.C.P. LOND.,
ASSISTANT MEDICAL OFFICER IN CHARGE OF THE POST-ENCEPHALITIS LETHARGICA UNIT OF THE METROPOLITAN ASYLUMS BOARD, WINCHMORE HILL, LONDON.

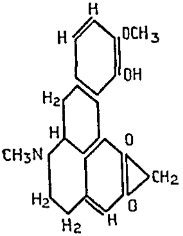
THE disorders of behaviour that so commonly supervene upon an attack of epidemic encephalitis in children have proved up to the present almost completely resistant to any form of treatment. Those suffering from them provide a serious problem both to the parents and to the public health authorities owing to the violent, atrocious, and dangerous forms that their actions take and to the fact that, as their intelligence is so well preserved, it is difficult to place them permanently in institutions.

Failure of Inhibition and its Results.

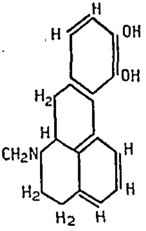
The symptoms are, of course, due to organic disease of the brain and occur usually, and in their most severe forms, in children who are free from parkinsonism or who suffer only from hemiparkinsonism. They are comparatively mild and rare in cases of general parkinsonism. The mental state is one of a loss of inhibition over the primary emotions and—inseparable from these—the innate tendencies towards instinctive behaviour. Thus any stimulus which tends to arouse a primitive instinctive response and the connected emotional state arouses it in these patients to a highly exaggerated extent. For example, the ordinary anger of a normal child when it is thwarted, after the onset of the disease becomes much more violent, prolonged, and easily roused. Because they are so much more instinctive than normal children, they live in continual and restless pursuit of crude emotional gratification, which naturally often takes outrageous forms. They are the slaves of their exaggerated emotions and, though many of them use their intact intelligence to find excuses for themselves, others realise their own state and exhibit distress and repentance. Expressed in popular terms, the marked characteristics of the patients are: pursuit of their own way, impulsiveness, restlessness, lack of self-control, lack of concentration, disobedience, and defiance. Doubtless the reason why after encephalitis this condition appears commonly in children and very rarely in adults is that young people are normally so much more immediately instinctive in their behaviour. The cases are chronic, most of them tending to remain stationary for years, except when parkinsonism supervenes. It will be of interest to observe their progress when they reach a mature adult age, but at present some form of effective treatment is urgently required.

An Attempt to Treat the Symptoms.

As the behaviour disorders are due to organic disease, attempts at psychotherapy are illogical and have proved futile. Drug treatment appeared the most hopeful measure symptomatically, but has hitherto been a complete failure. All the common cerebral depressants, narcotics, and hypnotics, the employment of which seemed naturally indicated, exerted no effect unless given in such large doses as to send the patient to sleep. Recently, however, very encouraging results have been obtained in his hospital by the employment of bulbocapnine. This drug is, according to Gadamer, an alkaloid extracted from *Corydalis cava* (Bulbe creux) and, though its pharmacological action is quite different, it has a chemical structure closely related to that of apomorphine.



BULBOCAPNINE.



APOMORPHINE.

When given to our patients in doses of 0·1 to 0·2 g. three times a day, whether by mouth or hypodermically, it exerted, after two or three days at the most, a marked beneficial action on the mental state and behaviour. This continued as long as the administration of the drug was maintained (a period of about eight weeks' treatment being the longest so far given) except that in some cases a tendency to acquire a tolerance became evident after a few weeks and necessitated an increase of dosage. The beneficial effect at once disappeared on omitting the drug. The absorption was very rapid even when given in sugar-coated tablets by mouth, the first effects appearing as a rule within 30 minutes. Elimination was also very rapid and there was no evidence of a cumulative action. After absorption the first sign was usually drowsiness, and often light sleep, lasting 10 to 30 minutes. This passed off and the patients became normally awake and alert again, but it was then evident that the abnormalities of their mental state and behaviour were markedly diminished. This effect lasted for several hours after the dose. Hyper-affectivity, impulsiveness, and restlessness were much lessened. The patients were not so noisy and defiant, and outbursts of anger, fighting, and interference with their fellows were less severe and frequent. Concentration on school work was much improved in several cases and more ready obedience was displayed. Some of them became practically no more troublesome to look after than normal boys. These doses produced few physical effects in cases free from parkinsonism other than a transient headache, which was complained of by some of the patients during the first day or two of administration. One or two patients appeared to feel the loss of the impulses to behave in their usual way, because for the first three or four days of treatment they complained of not wanting to do anything and sometimes went off naturally to sleep (from which they were easily roused). However, they remained normal and wide-awake during this period if their interest was held by some occupation, and later the complaint and tendency to sleep—except just after the dose—passed away. The syndrome of one case of mild general parkinsonism to whom the drug was given was made worse, the patient becoming more rigid whilst his slight behaviour disorder was little affected.

Except in this last case, which also displayed dystrophia adiposogenitalis, the beneficial effect on the behaviour and mental state occurred in each of seven patients who received bulbocapnine. Brief clinical notes of the six successful cases are given.

Notes of Six Successful Cases.

CASE 1.—Male, aged 12 years, had an acute attack of epidemic encephalitis in April, 1924. Very soon he developed habits of spitting and swearing, was irritable, and was noisy all night. He was admitted to this hospital in March, 1926. He was well-developed, and the only abnormal physical sign was a sluggish pupillary reaction to accommodation. Intelligence was very good and memory fully preserved. There was extreme restlessness and inability to sit or stand still for long. No occupation was persisted in for more than a few moments and any sustained concentration was impossible. He was hopeless in school. Many tics, such as spitting, whistling, and licking his lips, were constantly indulged in, and slight tachypnœa developed in the evenings or when he was excited. He was very impulsive, noisy, and self-assertive, and was always interfering with the other boys, punching them without provocation and for no reason. Any restraint or interference at once led to a violent outburst of temper and assault. He would fight fiercely over the smallest trifles. His condition had remained stationary since admission.

On Jan. 19th, 1929, bulbocapnine treatment was begun in doses of 0·1 g. thrice daily hypodermically; two days later his behaviour was definitely milder and quieter. Immediately after injection he was a little drowsy for 15 to 30 minutes and then normally awake again. On the 24th there was still short drowsiness after each injection, but fighting and temper were much diminished. On Feb. 4th the behaviour of the boy in school was much improved and he was doing better work. He slept for 20 minutes after each injection. On the 15th he showed no temper or restlessness and was as well behaved as any boy in the ward. On the 19th the drug had been omitted for three days; he was much more restless and bad-tempered, and very noisy. The change was very marked.

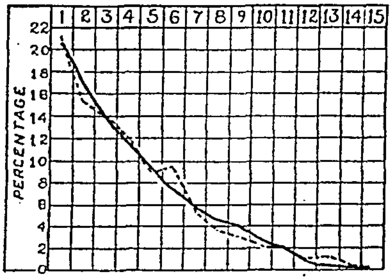
CASE 2.—A boy of 8 had an acute attack of epidemic encephalitis in the autumn of 1924, with a fit and left internal strabismus. A change in behaviour took place immediately afterwards; he threw knives about, swung the cat by its tail, and stole things. There was much nocturnal restlessness. He was admitted to this hospital in December, 1926. He was very small for his age but was otherwise physically normal. Intelligence and memory were good. He was very restless and never sat down or concentrated on anything for more than a few minutes, and was constantly fidgeting and displaying, hopping, licking, and finger-snapping tics. He was impulsive and paid no attention to others, pursuing his own way all the time. He was constantly trying to annoy the other boys by calling them names, and was very disobedient, self-assertive, and talkative. There was an occasional display of over-affection for members of the staff. Petty stealing and consequent lying and much purposeless destructiveness were observed—e.g., he cut away all the ward blind-cords and hid them. Mutual masturbation with another boy was common and he made several attempts to run away. Much temper and fighting took place daily. He was hopeless in school. His condition remained stationary except for day-to-day fluctuations.

Bulbocapnine, 0·1 g. thrice daily hypodermically was commenced on Jan. 25th, 1929, and definite specific improvement in behaviour was observed. Restlessness greatly diminished; instead of chasing noisily round the ward shouting, poking the fires, and destroying things, he sat quietly playing draughts, showed no temper or fighting, and gave no trouble. On Feb. 15th his behaviour was still extremely good—as good as that of anybody in the ward—and he was much less restless. He made no complaints but slept lightly for 20 minutes after each injection.

CASE 3.—A boy of 11 had an acute attack in 1921, when he was drowsy for a short time. This was followed immediately by a change in behaviour. The patient was admitted to this hospital in April, 1928. He was physically normal except for marked polydipsia and polyuria, upon which injections of pituitrin had no effect. His intelligence was excellent, and when he was willing to work he was one of the best boys in the school. There was great general restlessness, impulsiveness, aggression, self-assertion, and desire to have his own way. When obstructed he kicked and stamped with a rage that was described as "terrible." He interfered with the other boys and tried to rob them of any of their possessions that he coveted. This led to quarrels in which he fought with fury. His fighting was often inhibited by fear, and then he vented his anger on himself by banging his head on the wall or hitting himself with a stick for half an hour on end. He was very restless in the evenings, and it was two hours before he settled down to sleep, after running round the ward screaming. He was constantly asking for glasses of water and suffered from nocturnal enuresis. There were frequent exhibitions of pointless destructiveness and marvellous impromptu lying. His condition remained unchanged.

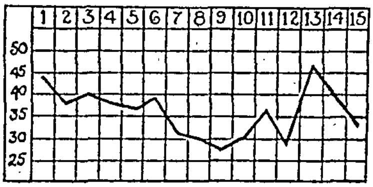
is seen that the same proportion of fourth and seventh children are affected as of first, and that from the ninth child to the last there is a greater percentage of affected than in the first place. This strongly suggests that the first-born is not in such a dangerous position as has been supposed.

FIG. 1.



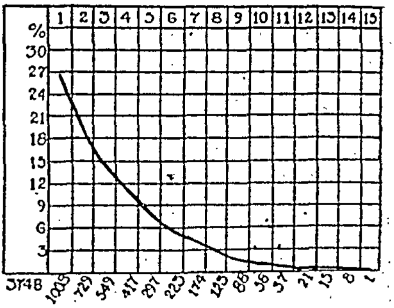
Solid line represents the percentages in each place in the family of 1585 persons, in 286 families, in which there were 600 persons affected with hereditary defects. Broken line represents the percentages of these affected 600 occurring in each place in the family.

FIG. 2.



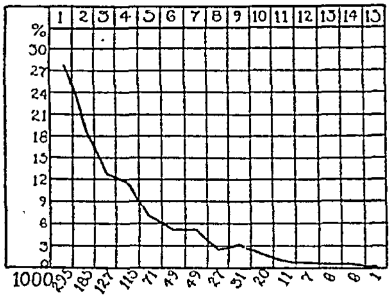
Represents the ratio of affected to unaffected members in each place in family in the 286 families above.

FIG. 3.



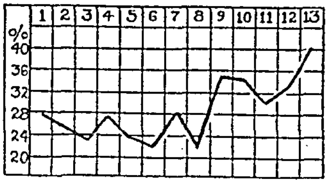
Curve showing percentages occurring in each place in family in 987 families comprised of 3748 members, of whom 1000 showed congenital defects.

FIG. 4.



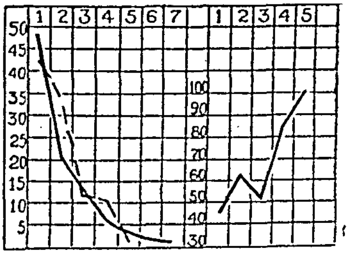
Curve showing percentages of the 1000 affected persons occupying each place in the family.

FIG. 5.



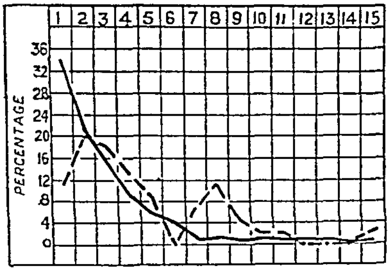
Curve showing the ratio of affected to unaffected members in each place in family in the 987 families listed above.

FIG. 6.



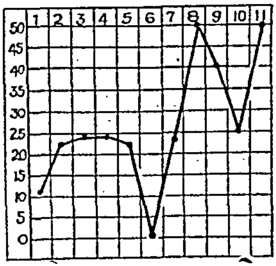
Left side of figure represents in the solid line Still's curve of affected occurring in each place in family based on 400 cases of congenital hypertrophic pyloric stenosis, while the broken line is based upon 59 cases collected by the author. The right side of the figure shows the ratio of affected to unaffected in the 59 families in which the 59 cases occurred.

FIG. 7.



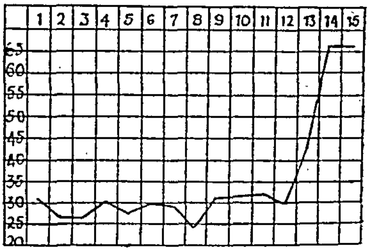
Solid line is Still's curve, showing the percentage of the affected occurring in each place in family in 280 families showing congenital heart disease. Broken line based upon 45 cases collected by the author.

FIG. 8.



Curve showing ratio of affected to unaffected in each place in family in the 45 cases listed above.

FIG. 9.



Curve based upon the combined congenital and hereditary cases listed above, showing the ratio of affected to unaffected in each place in the family.

Still arrives at exactly the opposite conclusion because he plots his curve of place-in-family from statistics based upon a population of which his cases were not a part, assuming that, were his families complete, they would average the same number of children as the population at large. This furnishes a large element of error. In the first place, cases from private practice show a much higher percentage of first-born children than does the population as a whole, since the families are smaller in the wealthier classes. In the second place, the appearance of one malformed child is often the cause of restricting the family, so that there is often no further opportunity for malformed children to be born. Populations differ widely in the number of children in each place in family, and the only safe criterion is the population from which the malformed cases come. Wile and Orgel[2] found that in 1000 families, 28·5 per cent. of the children were the first-born.

Still justifies this method, however, by stating that it makes little difference whether more children are born or not, since his statistics show that seldom is a second defective child born in a family which has already produced one abnormal infant. Here the element of voluntary restriction of the family enters, so that it may be readily understood why a second defective child is not born. In families in which restriction has not been practised or has not been successful, other children with malformations frequently occur. For example, while hunting for 1000 cases in which there was no family history of malformations, I found 64 families in which occurred 167 cases of the congenital type of abnormality usually regarded as non-hereditary. Thus for every 15 families with no familial distribution, there was one family in which there was more than one affected. These two errors, of assuming that the family will produce no more malformed infants once it has produced one, and of plotting his standard curve from a population other than that from which his cases came, lie at the foundation of Still's theory.

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[2] Wile I. S. and Orgel S. Z.: Internat. Clin., 1928, iii., 145.

The same is true of the particular instances in which Still finds a marked influence of primogeniture, such as congenital hypertrophic pyloric stenosis and congenital heart defects. If we plot our standard curve from the families from which the patients came, there appears no tendency for the first-born to be unduly affected. Fig. 6 give Still's curve based upon 400 cases of pyloric stenosis in the solid line, and mine based upon 59 cases in the broken line. They are sufficiently similar to indicate that the 59 cases were a representative group. In the right-hand side of the figure are the values showing the ratio of affected to normal in the 59 families from which my cases came. Here the first-born is actually the least frequently affected. The same applies to congenital heart defects, although in this case objection might be made that the 45 cases listed in Fig. 7 are not representative, since they do not agree with the curve based on Still's 280 cases (Fig. 7). Picked at random as they were among the group of 1000 cases, they should show some tendency for the first-born to be more often affected if Still's theory were true. Fig. 8, showing the ratio of affected to normal in these 45 families, again shows a lessened tendency on the part of the first-born to exhibit congenital heart defects. When the hereditary and congenital cases are grouped together and the ratio of affected to normal plotted, as in Fig. 9, we see that the first-born in 1600 cases is not more liable to defects than the rest of the family.

It may be objected that congenital defects, usually regarded as non-hereditary, should not be classed with inherited diseases. It is my belief that all developmental defects are inherited, whether there is a family history or not. Some of them may be due to such a complex grouping of determiners in the germ-cells that the chances for more than one child in a family being affected are very remote. On the other hand, there are numerous instances in which such conditions as hydrocephalus, spina bifida, hypertrophic pyloric stenosis or anencephaly are obviously familial, so that we may assume that if they are inherited in one instance they are in all.

The most convincing argument, however, against Still's theory is not the statistical one, since the same numbers will be interpreted differently according to the worker's point of view, but the large number of instances (7 per cent. in the series of 1000 cases) in which the first pregnancy terminated not only in a malformed infant, but in a normal twin as well. If primogeniture be at the basis of the abnormality, why did it not affect both inhabitants of the uterus? The theory of primogeniture falls here, but the explanation that the defects are inherited deals adequately with the situation. How unjust to the parents who have already had the misfortune of bringing into the world one defective child to raise their hopes by false promises! How tragic for them when our promises fail to materialise, and a second malformed baby comes into the world! Although it would be gratifying to be able to assure them that their later offspring will be normal, can we conscientiously do so when we realise that, out of every 16 families in which congenital defects not obviously inherited occur, there will be at least one family, perhaps more, in which there will be more than one defective child? Is it not better to be accurate than to be too hopeful, with disastrous results?

THE MENACE OF APPENDICITIS.

By H. H. GREENWOOD, B.S. Lond., F.R.C.S. Eng.,
CONSULTING SURGEON TO THE GREAT WESTERN RAILWAY HOSPITAL, SWINDON.

It is not possible to estimate, with any approach to exactitude, the yearly incidence of appendicitis on the population; the only figures available are the deaths that result, as recorded in the report of the Registrar-General. Hospital records merely tell us the number of cases admitted to the larger general hospitals, and these bear no constant proportion to the total number.

The pious hope that the insurance card records would furnish accurate returns has been only imperfectly realised. There is no reason to believe that the disease is becoming more frequent, yet the menace of appendicitis, as reflected in the deaths registered, has not diminished since the dawn of the present century. We certainly cannot lay the flattering unction to our souls that the march of knowledge, the more elaborate and widespread equipment of surgical theatres, or a more efficient technique, have in any way diminished the heavy toll of human lives exacted by this eminently curable disease.

For the first four quinquennia of this century, the death-rates per million persons rule 50, 62, 69, 67, and during the ten years, from 1918 to 1927, both the total number of deaths and the death-rate reveal a disquieting increase. It is interesting to compare the rates obtaining for hernia and for intestinal obstruction during the corresponding period (Table I.) in both of which diseases there is a definite decrease in the mortality-rate.

TABLE I.

—	Rate per million persons.	
	1918.	1927.
Intestinal obstruction ..	81	65
Hernia	64	50
Appendicitis	65	70
Total number of deaths	2426	2760

Mr. E. R. Flint,[1] reviewing the deaths from "acute abdomen," at the Leeds General Infirmary, for 1924 and 1925, includes 1080 cases of acute appendicitis with a death-rate of 5·7 per cent. About one-half of these were uncomplicated by abscess or general peritonitis, and of these none died—incidentaly there is no reason why they should—but the remaining half (presumably requiring drainage) seems an unusually large proportion. In my own series only 18 per cent., and in Mr. Grey Turner's series about 26 per cent. were of this severe character. Mr. Grey Turner,[2] in analysing 2252 cases shows, amongst other interesting data, 135 cases uncomplicated by peritonitis, with no deaths; 913 internal operations (also presumably free from peritonitis) with only three deaths, but of 95 cases with diffuse peritonitis 28 (or 29 per cent.) died. The total death-rate for all varieties was only 3·5 per cent. Mr. McNeill Love,[3] in his Hunterian lecture of Feb. 4th, devotes considerable space to a searching analysis of 2018 cases, over a period of five years, and discloses disturbing figures in his table of the results obtained at three large general hospitals—namely, the London, St. Thomas's, and the Manchester Royal. The average total death-rate following immediate operation was 6·7 per cent., rising at St. Thomas's to 8·4 per cent., whilst the average total death-rate following "expectant" treatment was only 3·8 per cent. Regarded superficially these figures should carry conviction, but within them is concealed at least one fairly obvious fallacy. The "immediate" cases include all those definitely perforated or gangrenous cases in which diffuse peritonitis and severe toxæmia are present, and whose mortality-rate in Mr. Grey Turner's series reached the gloomy figure of 29 per cent. These swell the total death-rate of the "immediate" cases, and vitiate comparisons. On the other hand, the deaths under "expectant" treatment (5·7 per cent. at the Manchester Royal, 4·2 per cent. at St. Thomas's, 3·5 per cent. at the London Hospital) occur amongst a group of selected cases, free from any loading by those dangerous, fulminating, and well-nigh hopeless cases in which a fatal termination is imminent. Yet amongst these selected cases, closely watched and nursed with meticulous care, there are 3·8 per cent. of deaths. It is evident that a certain proportion resolve and are operated on as clean cases, none of which should die. The mortality arises presumably amongst those cases which refuse to resolve, marching forward towards disaster and compelling surgical intervention.

It would seem that these must be accounted as errors of surgical judgment since the crucial time for intervention has been deliberately allowed to slip by. The Ochsner treatment has, in many cases, already been adopted before the case comes into hospital and the time for temporising has passed. There are so many factors which conspire to cause a fatal termination—e.g., virulence of the infecting organism, resistive powers of the patient—which cannot be accurately assayed, that one regards with suspicion so dubious a guide as the supposed danger period between the second and the sixth day. The reality of a specially perilous period, between the loss of the natural immunity and the calling-up of the protection conferred by an acquired immunity, is in consonance with the theory of a negative phase, but that this occurs with sufficient certainty between the second and the sixth day, to dictate treatment seems to rest upon too slender a foundation of academic speculation to warrant any deviation from the path outlined by the physical signs. In the race between the rising virulence of the poison and the patient's powers of resistance, the danger period comes to one case within a few hours, to another it may never come at all. There can never be, in any case capable of spontaneous resolution, any period of absolute loss of immunity, else would the patient surely die. During the period of lowered immunity, a period that varies in onset and duration and degree with every patient, the only sure guide is the clinical picture; it is possible that the operation may still be safe during this period provided certain details of technique are adopted. The two cases that came under the observation of Mr. Love (justly stigmatised as "not surgery" by Mr. Grey Turner) were extreme examples, but as regards the operation and the manner of it, it is strange that there seems to be such a lack of agreement amongst surgeons.

Technique of Operation.

The frequent avowal that the gridiron incision is still used at some of our large teaching hospitals is surprising. This incision is eminently suitable only for the removal of a perfectly normal appendix; for a real appendicitis, however mild, the limited exposure of the parts and the inadequacy of drainage when that is necessary—and it can never be with certainty foretold—are amongst the many drawbacks it imposes. It is strange that despite the repeated assaults on its efficiency, this incision has not become completely obsolete. The pararectal incision is similarly, though to a less degree, inadequate. The extent of the opening in the peritoneum is strictly limited by the distance between the nerves entering the outer border of the rectus muscle, and this distance, even in an adult, is rarely more than 2½ in.—a space quite insufficient to allow of the efficient treatment of any but the mildest cases; transgression of these limits incurs the certain penalty of an (incurable) ventral hernia. Rutherford Morison's almost transverse incision, advocated by Mr. Grey Turner, gives excellent exposure, free from the objections inherent in the gridiron incision. Unlike the paramedian incision, however, it cannot be prolonged upwards or downwards, a procedure desirable in certain contingencies, and for this reason I believe that a right paramedian incision at least 5 in., and in stout subjects 6 in. in extent, is to be preferred. In the series recorded here this incision has been invariably used. The right abdominal wall is then pulled well over to the right, large warm swabs shut off the pelvic cavity and cover the small intestines which are then drawn well over to the left. Whenever necessary the cæcum is mobilised along its outer border, a swab placed beneath it to arrest oozing, and the appendix can then be brought nearly to the middle for deliberate removal. Any pus released from a localised abscess is rapidly mopped away and its "bed" made clean and dry. Pus found free in the peritoneal cavity or in the pelvis is usually of a lower virulence than that immediately around the appendix, so that the latter requires careful removal whilst the former will be adequately dealt with by the pelvic drain. In *every* case where a localised abscess is present above the level of the pelvic brim, the "bed" that is left requires a separate drain through a stab puncture internal to the anterior superior iliac spine or through the loin. For the pelvic drain emerging from the lower angle of the wound a double tube is preferable. The pus draining through the stab puncture will be often found to remain virulent and offensive long after that coming from the pelvic drain has ceased or has become innocuous.

The fullest exposure of the parts, careful protection, and gentle handling of the small bowel and ample drainage seem to me vital features in an operation that is undertaken to save life. With full exposure and careful packing, handling of the small intestines is reduced to a minimum.

Experience in a Railway Hospital.

The results shown in Table II., obtained at the Great Western Railway Hospital, of 36 surgical beds which have served a fairly uniform population of 50,000 railway workers and their dependants during the two years April 1st, 1927, to April 1st, 1929, can claim a constancy in all the factors—a stable population, one standard of nursing, a definite technique, and one surgeon.

TABLE II.—*Analysis of 206 Cases of Appendicitis Operated on at the Great Western Railway Hospital, Swindon, between April 1st, 1927, and April 1st, 1929.*

Sex.	Cases.	Age-limits in years.	Cases drained.	Average age.	Deaths.
Males ..	101	$4^{10}/_{12}$ to 63	16	26	0
Females ..	105	$3^{5}/_{12}$,, 62	20	24·2	0

The series of 206 cases may be regarded as average, both as regards severity and age-limits; the rate of flow, about 100 cases per year, seems to be the usual number passing through the hands of any individual surgeon at a large hospital. In one case the appendix was deliberately left, and was removed later; in one case the critical condition of the patient and his age forbade removal, and no further operation has been needed; in all other cases the appendix was removed. A case of left-sided appendicitis with complete transposition of both abdominal and thoracic viscera was merely curious, and cases complicating pregnancy presented no special features of interest, since pregnancy continued undisturbed. The cases requiring drainage were 18 per cent. of the whole and include those in which there was diffuse purulent peritonitis and those cases of localised abscess where the degree of toxæmia indicated a relative virulence of infection; some cases of localised abscess where the pus was of low toxicity and where the "bed" of the appendix could be rendered clean and dry, were closed without drain.

Although the number of cases is comparatively small, I believe that the results obtained by individual surgeons possess a sharper interest and are more free from fallacies than are the deductions drawn from mass statistics. Massive statistics, such as the 2018 cases treated at the London Hospital over a period of five years, may minimise certain inequalities, but they conceal many important factors which defy analysis. These operations are done by various surgeons, with varying views as to clinical signs, with different methods of approach of drainage and of after-treatment, of varying expertness in the technique of dealing with the appendix—a tangle of values from which it is difficult to make safe deductions. The 2252 cases *personally* operated on by Mr. Grey Turner have a more dependable value in that they can claim at least one constant factor—namely, the surgeon. Even these range over a period of 20 years, during which time accumulated experience, increasing dexterity, and modifications of technique would render the data drawn from recent years more representative of an ideal.

It becomes increasingly evident that a reduction in mortality will only be effected by greater precision in diagnosis, earlier operation, a more lively appreciation of the serious nature of the disease, and by a standardisation of technique, especially by the abandonment of those obsolete methods of approach which give too limited an exposure. The present mortality from appendicitis may appropriately be examined in the light of the concluding words of Sir James Berry, in his presidential address to the Royal Society of Medicine, of Nov. 18th, 1920, weighty words that appear have shared the fate of the seed that "fell upon stony ground."

References.—1. Flint, E. R.: Brit. Med. Jour., 1928, i., 209. 2. Turner, G. Grey: THE LANCET, March 2nd, p. 465. 3. Love, R. J. McNeill: Ibid., Feb. 23rd, p. 375.

Clinical and Laboratory Notes.

THE TREATMENT OF MIDDLE-EAR SUPPURATION BY IONISATION.

BY J. D. McLAGGAN, F.R.C.S. ENG.,

ASSISTANT SURGEON TO THE LONDON THROAT AND EAR HOSPITAL; ASSISTANT AURAL SURGEON TO THE LONDON COUNTY COUNCIL.

THE following is a critical survey of the results of treatment in 1601 cases of suppurative middle-ear disease in children, with special reference to the method of treatment by ionisation.

The cases were seen at London County Council clinics over a period of three and a half years. Many of them had a discharge so scanty as to be barely perceptible, and required no further treatment than the insufflation of boric powder. Apart from these, all cases were ionised during the first few months, but after a short experience it was recognised that ionisation produced unfavourable results with certain types of ears. Also, owing to the rapidity with which the discharge recurred in children who had enlarged tonsils and adenoids, it became the routine to have these removed as a preliminary measure. If the discharge persisted after the operation, ionisation was carried out. With these exceptions all ears throughout the series were ionised. No selection was made of favourable cases, one of the objects being to find out what proportion of all discharging ears responded to the treatment.

Technique and Results.

The *technique* used was very simple and followed closely the lines advocated by Dr. A. R. Friel and Dr. T. B. Jobson.

The ear was thoroughly cleaned by syringing and mopping, and a small pledget of cotton-wool wrung out in a weak solution of cocaine and adrenalin was introduced into the meatus and allowed to lie in position against the tympanic membrane for three minutes. Thereafter as much pus as possible was sucked out into the meatus by means of Siegel's speculum and the child was instructed to carry out Valsalva's method of inflation so as to clear the Eustachian tube if possible. Then the meatus was again mopped dry. Sometimes the intratympanic tube was used to secure still more complete cleansing. The ionising fluid introduced into the meatus was zinc sulphate, grs. 2 to the ounce. If the perforation in the tympanic membrane was small, Siegel's speculum was used to ensure that the tympanum was filled with the fluid, the air in the cavity being first exhausted. The current used varied from 1 to 3 milliampères and was passed over a period of from 10 to 15 minutes. Afterwards the ear was mopped dry and a small quantity of boric powder insufflated. No further treatment of any kind was given until the ear was inspected a week later. If, at that time, the ear appeared perfectly dry the patient was instructed to report at regular intervals for examination. On the other hand, if the discharge continued but some improvement was noted, the ear was ionised again. *It was very rare for an ear which ultimately benefited* by ionisation not to show a marked improvement after two or three treatments.

Results.—It is always difficult to estimate the value of treatment, especially in a disease which undergoes periods of spontaneous improvement. In the Table I have included under the heading "dry following ionisation" only those cases which were seen to be dry immediately after the treatment, and which were dry at the inspections carried out at intervals of two and three weeks. Moreover, the majority were inspected six months later.

Total number of cases seen	1601
Total number discharged dry	1111
Number of cases ionised	919
Number dry following ionisation	485

Number discharged dry = 69·4 per cent. of total number seen.
Number dry after ionisation = 30·3 per cent. of the total number seen.
Number dry after ionisation = 52·8 per cent. of number of cases ionised.

When a case was discharged "dry" it was explained to the parent that there was still a perforation in the tympanic membrane, and that there was a likelihood of future ear trouble. Great stress was laid on the necessity of bringing the child back if this should occur. In all 101 cases, which had been finally discharged as dry following ionisation, reported with a recurrence of suppuration. This relatively high percentage (20·8) was accounted for mainly by the use of ionisation when there was a predisposing factor to recurrence in the nose or pharynx. The preliminary enucleation of enlarged tonsils and adenoids was a great aid to permanent healing. A notable feature of the ears in which recurrence of the discharge took place was the almost unfailing regularity with which ionisation cleared up the discharge a second time.

Control Cases.

As it had been stated that the success of ionisation was due to the thorough preliminary toilet and not to the ionisation, it was decided to test the truth of this statement. A hundred cases which were judged likely to respond to ionisation were treated by cleansing the ear exactly as for ionisation. Alcohol drops were then introduced and kept in the meatus for 10 minutes, the ear was dried out, and boric powder was insufflated. In no single case was an ear so treated seen to be dry at inspection a week later. In many there was a considerable lessening of the discharge, but none were quite dry.

The Favourable Type of Ear.

After experience had been gained it was not found to be difficult to foretell, with considerable accuracy, whether an ear was going to benefit by ionisation or not. The following points were found to be the chief aids in prognosis :—

1. *Duration of the Discharge.*—In many cases successfully ionised the history of the discharge went back to infancy. A long history was not considered a very unfavourable point, but a long-continuous history was of bad omen. Periods of intermission of several months' duration were favourable.

2. *Character of the Discharge.*—The most favourable type of discharge was the muco-purulent. The least favourable type was the persistently offensive, purulent discharge.

3. *Original Cause of the Onset.*—In the vast majority of the cases the parent was unable to give a definite cause of onset. Very often there was no history even of pain. In those cases which followed measles or scarlet fever the results were much worse than in the majority with no definite history of onset. Of 159 ionised cases which owed their origin to these diseases only 41 responded to the treatment—a percentage of 25·8, which compares badly with the over-all percentage of 52·8.

4. *Examination of the Middle Ear.*—Success was almost entirely limited to those cases in which the infection was confined to the mucous membrane of the middle ear tract, and in which there was no obvious involvement of the underlying bony structures. Thus a favourable examination was one which revealed a perforation through the membrana tensa only, or encroaching on the bony tympanic ring to a very small extent. The mucous membrane of the tympanum, as seen through the perforation, appeared to have its epithelial layer intact. The actual size of the perforation in the membrana tensa was not considered important. Those with a pin-hole perforation responded as well as those with a large one if care were taken to introduce the ionising fluid into the middle ear by the use of Siegel's speculum. An unfavourable finding was the presence of granulations or polypi, which were looked upon as indicating a greater or lesser degree of bone necrosis. Equally unfavourable was a perforation through Shrapnell's membrane or through the outer attic wall. Perforations in this region usually seemed to be associated with cholesteatomata, and no success was obtained in those cases.

5. *Examination of the Nose and Pharynx.*—The presence of enlarged tonsils and adenoids, or other septic foci in the nose and throat, did not prevent the ear from responding to ionisation, but they rendered recurrence frequent and rapid, and should be dealt with before ionisation.

Results in Selected Cases.

During the last six months of the period during which the ears were seen a special group of 21 cases was selected as being especially suitable for ionisation. Of these cases no fewer than 19 dried up and have remained dry until the present time. The large percentage (90·4) of dry ears obtained in this series affords grounds for the statement that, with experience, it was not a difficult matter to foretell with a degree of certainty whether an ear would answer to the treatment or not. These selected cases were not included in the table.

Advantages and Disadvantages.

As stated above, harmful results followed the ionisation of certain ears. The following are contra-indications to ionising :—

1. The presence of acute inflammation. The preliminary syringing appeared in some cases to carry infection to the mastoid antrum and precipitated an attack of acute mastoiditis. There were two cases which lent support to this belief.

2. Marked involvement of the structures in the mastoid process. It was found to be difficult to estimate the degree to which the mastoid process was involved, but ionisation was feared in two classes of cases: first, those which gave a history of recurrent attacks of earache and mastoid pain, the attacks usually coinciding with a short period of cessation of the discharge, and being relieved by its renewed onset; secondly, cases which showed a postero-superior perforation with marked involvement of the bony tympanic ring and in which pus could be freely aspirated from the direction of the aditus.

3. The presence of manifest cholesteatomata.

4. A history of vertigo, with or without the presence of the fistula sign. Apart from the fact that these were usually cases in which there was evident bone necrosis, ionisation readily produced in them an attack of giddiness, often with vomiting.

The *advantages* may be summarised as follows :—

1. The treatment is an easy one for the specialist to apply and takes very little time.

2. After experience had been gained, and the unsuitable type of ear omitted from the treatment, no bad result was obtained.

3. It was found easy to apply the treatment in children as young as four years of age.

4. Ionisation did away with inefficient home treatment and the unsatisfactory cleansing of the ears by drops.

5. Ionisation produced a cessation of the discharges in 30·3 per cent. of all the cases seen. When the cases were carefully selected this percentage was very greatly increased.

In my opinion ionisation, while not by any means solving the problem of the treatment of all chronically discharging ears, is a very valuable therapeutic aid and should be more extensively used by the otologist than it appears to be at present.

THE TREATMENT OF ULCERS OF THE LEG WITH MAGNESIUM SULPHATE.

BY J. H. YOUNG, M.B., CH.B. EDIN.,
LATE JUNIOR RESIDENT MEDICAL OFFICER, CRAIGLOCKHART HOSPITAL, EDINBURGH.

OF all the conditions which cause heartburning in practice, ulcers of the leg are amongst the worst. Many patients go about for years with such lesions, treatment of all kinds having failed. They frequently cause loss of working time.

During the early part of 1928 I had the opportunity of observing the effects of solutions of magnesium sulphate on ulcers of this kind. The successful use of this drug in the treatment of inflammatory conditions has been reported on by Alston,[1] Choksy,[2] and Tucker,[3] but as far as I know, no mention has been made of its employment in the treatment of ulcers of the leg. The observations were made at Craiglockhart Hospital, Edinburgh, a poor-law hospital. Almost every case of ulcer admitted had become callous, and several were of some years' standing. Many had been treated by various remedies without improvement. Without exception, the use of magnesium sulphate solutions improved the condition of affairs, and in over 80 per cent. of cases complete healing resulted.

The patients were all confined to bed with the foot of the bed elevated. Soaks of a 5–10 per cent. solution of magnesium sulphate were applied and the dressing renewed thrice daily. The following case is typical of many.

A married woman, aged 52, was admitted on March 28th, 1928, with an ulcer of several years' duration. It was situated on the left leg and extended from the tuberosity of the tibia to within 3 inches of the ankle-joint. It involved three-quarters of the circumference of the leg, and in the middle third the entire circumference except for one inch. There was a profuse discharge of fœtid pus and the leg was swollen and œdematous. The Wassermann reaction was "marked positive," but on a previous admission to hospital the exhibition of neokharsivan and bismuth over a prolonged period had failed to improve the condition. There were no obvious varicose veins.

Treatment with eusol for 17 days left the condition unchanged. On April 14th, 1928, treatment with 7½ per cent. soaks of magnesium sulphate was begun. The discharge of pus was quickly replaced by one of serum. This appeared to clean up the ulcer and rapid improvement set in. Healthy granulation tissue began to form in the base of the ulcer and epithelium soon started to grow in from the edge. Before commencement of the new treatment the longest diameter of the ulcer, allowing for outlying islets, was 20 cm. Within ten days this was reduced to 15 cm., and by September the lesion was completely healed. She was kept in bed during the greater part of the treatment, but was allowed up for a short time each day during the last month.

A considerable number of similar and varicose ulcers were treated in the same fashion with the excellent results previously mentioned, and I am firmly convinced that as a stimulant to epithelial growth magnesium sulphate stands alone.

It may be of interest to record a case of tuberculous ulcer treated by the same method.

Following a cellulitis of the left leg, a man, aged 56, developed an ulcer on the postero-lateral aspect of the middle third of the left leg. The edges were purple in colour and markedly undermined. The floor was covered by a black slough, and there was a profuse discharge of pus. Such was the state of affairs on April 24th, 1928. Under treatment with 5 per cent. magnesium sulphate solution the slough came away in four days. A portion of tissue from the base of the ulcer was then removed for microscopic examination. The report was as follows: "Sections show the presence of tubercular infection." On May 2nd there was marked improvement. The ulcer was much smaller and actively growing epithelium was present at the edge. Healing continued steadily, and was complete by June 13th. One month later there was a slight recurrence rapidly cured by similar treatment. The patient was still well three months later. A conspicuous feature was the very slight degree of scarring and absence of pain.

I am indebted to Dr. J. W. Keay and Dr. M. M. McGarrity, principal and senior medical officer respectively of Craiglockhart Hospital, for permission to publish these cases.

References.—1. Alston, J.: Caled. Med. Jour., 1928, xiii., 442. 2. Choksy, N. H.: THE LANCET, 1911, i., 300. 3. Tucker, H.: Therapeutic Gazette, 1907, p. 238.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTIONS OF SURGERY AND MEDICINE.

A JOINT meeting of these two sections was held on May 1st, Sir HOLBURT WARING, President of the Section of Surgery, in the chair. Dr. HUGH THURSFIELD opened a discussion on the

INDICATIONS FOR AND RESULTS OF SPLENECTOMY.

In this matter, he said, wisdom came but knowledge lingered. The advance of surgical technique had given us in recent years a considerable body of acquired wisdom whilst knowledge of the physiology and pathology remained largely a matter of conjecture and hypothesis. The two undisputed physiological facts were: (1) that the spleen was concerned in the process of digestion, contracting and dilating with the demands of the organism and apparently regulating the supply of blood to the abdominal viscera; (2) that it was enlarged in nearly all acute infections. Every other statement about its function was mere surmise. Other undisputed facts were: (*a*) that the organ recognised as the spleen was seldom if ever the only representative of splenic tissue in the abdominal cavity; splenectomy therefore did not remove all the splenic tissue in the body; (*b*) that the removal of the spleen produced no permanent change which could be constantly identified except that the normal fragility of the red blood cells to saline solutions was definitely and permanently decreased. In particular, splenectomy produced no permanent effect on hæmopoiesis; leucocytosis or leucopenia occurred normally after the operation and the immediate post-operative increase in blood-platelets was temporary only. An enormous practice of splenectomy had grown up during the last 25 years and, although it was based almost entirely on faulty hypothesis, it was fully justified by empirical success.

Indications for Splenectomy.

Splenectomy had become routine practice for at least three diseases: splenic anæmia, congenital acholuric jaundice, and essential thrombopenia. It was possible to recognise a clinical entity called splenic anæmia on the following criteria: chronic cryptogenic primitive splenectomy with no enlargement of lymph glands and the following blood changes: diminution in erythrocytes with absence of erythroblasts, diminution in the hæmoglobin, usually with a colour-index less than 1, diminution in the leucocytes with absence of myelocytes, and diminished or normal fragility of the erythrocytes. Under these conditions splenectomy was indicated as soon as possible and would restore the invalid to decent health, protect him from the almost certain hæmatemesis and possibly cure him. The indications for operation in congenital acholuric jaundice were attacks of anæmia or weakness and the encumbrance of the enlarged spleen. The operation could fairly be said to cure the disease and the fragility of the red cells became normal after a few months. The results of splenectomy were also brilliant in cases of that special type of hæmorrhagic purpura formulated in 1916–17 by Viennese workers and given the name of essential thrombopenia or thrombocytopenic purpura. The restoration of the number of blood-platelets was only transient, but removal of the spleen stopped the hæmorrhages. The operation was indicated by recurrence of severe purpura whether or not the platelets were normal or the spleen clinically enlarged. More than 80 per cent. of cases had been relieved. In acute purpura, however, the figure was only 16·6 per cent., though earlier operation might improve the results. Many workers were abandoning the idea that a thrombocytopenia was a necessary indication for splenectomy.

Among the many other diseases for which the spleen had been removed were acquired hæmolytic jaundice, pernicious anæmia, cirrhosis of the liver, myelocytic leukæmia, and chronic infections such as Egyptian splenomegaly, malaria, tuberculosis, and syphilis. In many cases of acquired hæmolytic jaundice there was extensive disease of the biliary passages, so that simple splenectomy was not likely to give good results. Provided the complication were attended to, 60 per cent. of success had been obtained with splenectomy in the early stages. Strikingly good results had been obtained in pernicious anæmia before the liver treatment obviated operative measures. It had been believed until recently that splenectomy was contra-indicated in cirrhosis of the liver, but if the hepatic function were not too badly impaired, removal of the spleen would bring a cirrhotic process to a standstill, and this measure should be anxiously considered in all early cases.

A Classification of Splenomegalies.

Mr. A. J. WALTON said that the surgeon must evolve a classification upon which to base his views. The diseases causing splenomegaly were so rare that no one surgeon could meet enough cases to give him exact knowledge of the risks and end-results; he must depend on statistics and theoretical considerations. The only common *injuries* were rupture and torsion. Rupture due to direct violence was uncommon and might follow a remarkably slight trauma. The symptoms were those of severe intra-abdominal hæmorrhage and the source of bleeding could seldom be identified. The immediate results of operation had shown steady improvement; the high mortality was due to shock, hæmorrhage, and the other injuries. Removal of the spleen was followed by anæmia, leucocytosis, and lymphocytosis lasting about a year, and then by eosinophilia for about three years. Many had found also an increased resistance of the red cells to hæmolysis, and consequently a reduction in the amount of bile-pigment. The platelets also were increased in number. Spontaneous rupture was nearly always associated with previous splenomegaly and good results had followed operative treatment. Torsion only occurred when the viscus had a relatively long pedicle, which was rare; it was likely to be mistaken for torsion of an ovarian cyst. The results of splenectomy were very good indeed.

Local lesions could be divided into cysts and tumours. The true *cysts* were angiectatic, neoplastic, dermoid, or parasitic, and the false cysts traumatic, inflammatory, or degenerative. All cysts were rare. In countries where hydatid cysts were common splenectomy was by no means the operation of choice, and a mortality of 14·3 per cent. had been recorded in 56 cases. Non-parasitic cysts were more common in men than in women. False cysts might be single or multiple. Nearly all cysts caused a tumour which if large altered the splenic outline and if suppurative caused pain, tenderness, and pyrexia. Most of them were best treated by splenectomy, but a large suppurating adherent cyst might need drainage and marsupialisation. Local removal was not usually satisfactory. *Tumours* of the spleen might be fibroma or fibro-sarcoma from the capsule and trabeculæ, lymphoma or lympho-sarcoma from the lymphoid elements, or angiomata or endotheliomata from the vascular and sinus endothelium. The first group usually caused a localised tumour diagnosed simply as splenomegaly and best treated by splenectomy. Lymphomata were often associated with general lymphoid enlargement, making distinction from Hodgkin's disease very difficult. Splenectomy was likely to be very unsatisfactory if there was general lymphatic enlargement. Great splenomegaly due to enormous enlargement of the Malpighian bodies, with general enlargement of lymphatic glands and a normal blood count constituted a syndrome which should be treated by X rays. The vascular endotheliomata were usually simple tumours, of pathological rather than of clinical interest. Gaucher had originally regarded his disease as an endothelioma, but it had now been removed from this group.

Acute inflammations could be provisionally grouped as localised (or abscess) and diffuse, either septic or specific. In all septic conditions the spleen tended to be large, soft, and flabby, but did not cause any symptoms. Abscess was rare and usually followed a localised necrosis, as in infarct. Drainage might be required for an abscess, but otherwise acute inflammations called for no surgical interference. *Chronic inflammations* occurred in: pyogenic conditions, splenic anæmia, cirrhosis of the liver, Hodgkin's disease, malaria, kala-azar, syphilis, tuberculosis, and secondary polycythæmia. The splenomegaly of chronic pyogenic inflammations might closely simulate that of splenic anæmia and could only be differentiated from it by finding the primary septic focus. It was very difficult to determine what part the spleen played in the clinical picture and secondary changes. A. G. Gibson stated that there might be hyperplasia, reduction of lymphoid elements, and infarcts due to local changes, and believed that embolism of the splenic vein sooner or later produced gross destructive and fibrotic changes in the liver. He believed that all forms of splenic inflammation tended to the destruction of blood-elements in varying degree. Splenectomy would not be suggested for enlargement of the spleen directly dependent on some septic focus. The pathology of *Banti's disease* was not understood, but the satisfactory results of splenectomy were best explained by classing it with the chronic inflammations. It was generally accepted that the disease had three stages: (1) splenomegaly and secondary anæmia which might last for ten years or more, and was generally described as splenic anæmia; (2) gradual enlargement of the liver; and (3) gradual cirrhosis and shrinking of the liver with ascites. There was a secondary anæmia with leucopenia and relative lymphocytosis and repeated hæmorrhages, especially from the stomach. There seemed to be no medical means of treatment; in the second stage operation was very satisfactory. The platelet count might be important even in this group. When there was ascites or jaundice the surgical outlook was not so good, and many died from post-operative gastric bleeding. A. G. Parsons said that if the cirrhosis were not too severe the liver might make a functional recovery. *Von Jaksch's anæmia* had such distinct differences from Banti's disease that it should be regarded as a separate clinical entity. It showed a familial tendency and was confined to the first three years of life. In addition to the splenic enlargement, the secondary anæmia, and the relative lymphocytosis, there was a constant myelæmia, the presence of nucleated red cells, and a tendency to spontaneous recovery. It was often associated with rickets, to which it might be partly due. With a recovery-rate of 65–70 per cent. and no tendency to persist, splenectomy was unnecessary. When it was certain that the spleen was affected before the liver, splenectomy might be useful for cirrhosis, but in common cirrhosis the operation was still in an experimental stage. Whatever the nature of *Hodgkin's disease*, the spleen formed only a small part of a general change and splenectomy was useless. The spleen acted as a storehouse for red blood cells and probably for this reason large numbers of parasites in *malaria*, *kala-azar*, and *syphilis* might find lodgment in it. In tuberculosis the spleen might show multiple miliary tubercles, or the foci in the rest of the body might be small or nearly cured while one or two areas in the spleen progressed to caseating masses. An enlargement of the spleen in children with anæmia should always suggest syphilis; there might be no improvement until the spleen was removed. There was always a risk of a later general infection if the spleen were removed for tuberculosis. Splenectomy in the protozoal and tuberculous group must be regarded as an exceptional measure, only to be carried out when all forms of medical treatment had been tried and it was certain that the spleen was the chief if not the only focus in the body. A secondary *polycythæmia* might occur with chronic non-suppurative thrombophlebitis of the spleen, and had been found in tuberculous children. On the assumption that polycythæmia was secondary to chronic inflammation splenectomy had been practised with success in one case. Primary polycythæmia would probably be classified with general blood disease when more was known about it; there were no indications for splenectomy, for more rather than less splenic tissue was needed to deal with the excess of red cells.

General Blood Diseases.

The diseases in which the change in the spleen seemed to be part of a general error in the hæmopoietic system were divided into an aplastic and a hæmolytic group, but there was no sharp line of division. True *aplastic anæmia* was chiefly found in young women and was rapidly fatal, so that splenectomy was not suitable. Many believed, however, that an aplastic condition might be a late stage of long-continued destruction, so that splenectomy in the early stage, before the marrow became aplastic, might diminish the strain on the marrow. The three cases operated on had all died. The hæmolytic group included pernicious anæmia, intestinal parasites, syphilis and carcimoma, puerperal lesions, chemical poisons, hæmolytic or acholuric jaundice, and purpura hæmorrhagica. Even if *pernicious anæmia* were originally due to excessive destruction of the red cells, the formation of new elements was undoubtedly at fault in the established condition. Even those who had advocated splenectomy had generally combined it with massive and repeated blood transfusion and the thorough treatment of all septic foci. Even with careful selection the surgical results were unsatisfactory. Since the introduction of liver treatment the operation was not justifiable. The profound hæmolytic jaundice found in the late stages of syphilis or carcinoma, as a complication of the puerperium, after the ingestion of chemical poison or during infestation with intestinal parasites, did not call for surgical interference. *Acholuric jaundice* might be compatible with active life, but in other cases the attacks of jaundice were associated with fever and malaise and with enlargement of the liver and spleen which might be painful. In the acquired type the attacks were more frequent and more severe and the patient soon showed a profound anæmia. The condition was often complicated by the formation of pure pigment gall-stones. The primary factor in the disease seemed to be an increased fragility of the red blood corpuscles—although this was not invariable—so that they were destroyed by the spleen and caused an increase of bile-pigment in the blood, though not in the urine or stools. In long-standing cases the anæmia might be increased by hæmorrhages. The enlargement of the spleen was moderate and variable, usually greater during the exacerbations. Splenectomy was followed by very good results and the mortality was low. *Purpura* might occur as a symptom of many conditions, but a very distinct type of the primary disease—thrombocytopenic purpura hæmorrhagica—had been differentiated. It was commoner in women and was essentially a disease of early life, though it might occur at any age. The diagnosis was made on the definite and distinct blood picture: a low platelet count, prolonged bleeding time, failure of blood-clot to retract, normal clotting time, and appearance of petechiæ below a tourniquet. Soon after splenectomy the number of platelets rose very considerably, so that an operation in the thrombocythæmic group of diseases (where the platelet count was normal or above) might cause widespread thrombosis, especially of the mesenteric vessels. Henoch's purpura was thrombocythæmic and purpura hæmorrhagica was thrombocytopenic. The diminution in platelets was an important but not the only factor in the production of hæmorrhage. H. L. Tidy had concluded that the underlying factor was an abnormal permeability of the vessel wall. The spleen was never greatly enlarged in purpura, but its size was some indication of its destructive action. A leucocytosis was evidence that the bone-marrow was still active. Acute types did not react well to surgical treatment, but for chronic relapsing cases there was no treatment but splenectomy. It was very difficult to distinguish one purpura from another and splenectomy should be reserved for the chronic relapsing cases, with typical blood characteristics, where it had a remarkable effect. The removal was usually easy and its mortality low, the platelet count rose almost immediately afterwards, and the bleeding diminished or ceased. If there was recurrence it was mild. This was the condition in which splenectomy gave the best results. *Gaucher's disease,* more common in women, was characterised by a considerable and progressive enlargement of the spleen and liver, by leucopenia, and sometimes by a secondary anæmia and browning of the exposed skin. The wedge-shaped thickenings in the conjunctiva were not absolutely constant. There was usually pain in the spleen and in the extremities, due to rarefaction of the bones, which might progress to deformity and fracture. The condition was familial but not hereditary, and was now generally regarded as a disturbance of metabolism. Some authorities nevertheless still believed that splenectomy had a place, though it could not prevent progress of the disease. Life was lengthened rather than shortened by operation, which might give considerable relief. In every case of splenomegaly a careful examination of the blood should be made; splenectomy for the leukæmias had been abandoned, although it could be performed with fair success after preliminary treatment with X rays and radium.

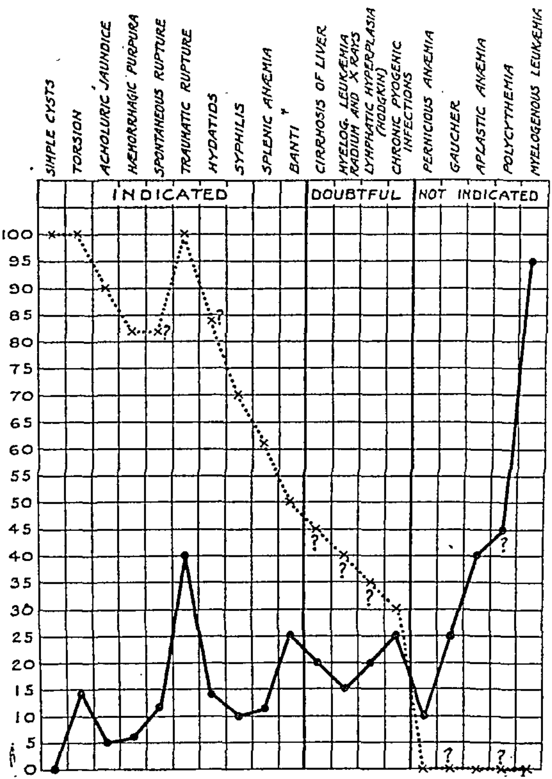

Chart showing operative mortality and end-results after splenectomy for different morbid states (Mr. A. J. Walton). Continuous line = operative mortality (percentage); interrupted line = post-operative recovery (percentage).

General Indications for Operation, and Technique.

The most important consideration was the platelet count, because of the danger of thrombosis if the platelets were many. A leucocytosis indicated that the bone-marrow was more active than if there were a leucopenia, and the degree of anæmia might indicate the extent of the hæmorrhage. In most cases the bigger the spleen the better the operative outlook. Free access was essential, especially in Banti's disease and inflammatory lesions, where there might be firm adhesions to the diaphragm. Mr. Walton preferred an incision running in the line of the intercostal nerves from the umbilicus to the left costal margin. From the lower end a left pararectal incision one inch from the midline passed up to the xiphoid. The oblique incision divided all the muscles in turn. The peritoneum was opened by a large triangular flap which was turned up over the left costal margin. This method caused no permanent harm to the abdominal wall, as it divided no motor nerves. The abdominal cavity was then surveyed rapidly, any change in mesenteric lymph glands being a bad prognostic sign. The stomach and intestines were packed off and the anterior peritoneal layer of the gastrosplenic omentum carefully divided. Ligature and division of the splenic vessels might be a delicate matter, for when the spleen was large the veins were often so friable that careful stripping with a gauze pad might cause furious hæmorrhage. If it satisfactory. *Tumours* of the spleen might be fibroma or fibro-sarcoma from the capsule and trabeculæ, lymphoma or lympho-sarcoma from the lymphoid elements, or angiomata or endotheliomata from the vascular and sinus endothelium. The first group usually caused a localised tumour diagnosed simply as splenomegaly and best treated by splenectomy. Lymphomata were often associated with general lymphoid enlargement, making distinction from Hodgkin's disease very difficult. Splenectomy was likely to be very unsatisfactory if there was general lymphatic enlargement. Great splenomegaly due to enormous enlargement of the Malpighian bodies, with general enlargement of lymphatic glands and a normal blood count constituted a syndrome which should be treated by X rays. The vascular endotheliomata were usually simple tumours, of pathological rather than of clinical interest. Gaucher had originally regarded his disease as an endothelioma, but it had now been removed from this group.

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Dr. THURSFIELD and Mr. WALTON replied.

SECTION OF OTOLOGY.

AT a meeting of this Section held on May 3rd, the President, Mr. SOMERVILLE HASTINGS, being in the chair, three papers were read on

DEAFNESS AND ITS TREATMENT.

Mr. HAROLD KISCH dealt with non-suppurative *types of middle-ear deafness.* There were, he said, three clinical groups, but mixed forms might occur: (1) deafness due to the results of attacks of inflammation; (2) deafness due to Eustachian and tympanic catarrh; (3) cases of otosclerosis. In the first group the deafness was due to adhesions formed in the middle ear, which obstructed movements of ossicles. Two extra factors might add to the deafness in this group: (*a*) the functional element, (*b*) a concomitant nasal catarrh due to nasopharyngeal catarrh. The treatment of this group was to prevent the onset of deafness at the time of the acute attack. Massage and inflation were important. If the ossicles were much bound down, massage did not remove the trouble, and the effect of removing the incus should be tried. For this he preferred the mastoid route. The difficulty was to estimate the degree of fixation of the stapes. If it was firmly fixed no improvement in the hearing would take place.

The majority of cases of chronic deafness belonged to the second group. Most of them yielded to rational treatment. The chief cause was nasopharyngeal catarrh, and he had found great relief ensue from inflation and massage. He first treated the nasopharyngeal catarrh, then applied local measures to the middle ear. In a hospital clinic, observation extending over a large number of cases showed that 95 per cent. of adults who had not had their tonsils enucleated possessed septic tonsils. A minute amount of septic tonsil left behind at operation sufficed to cause continued catarrh. Chronic catarrh of the frontal sinus was more frequent than was usually supposed, while in some cases sphenoidal sinus disease was present. Rectification of nasal septum deflection sometimes gave rise to immediate improvement. Simple inflation of the ear was the only local measure required. He did not favour the use of hot air or vapour for the purpose, and in his hands ionisation had not been of value. Diathermy was still on trial; in some cases it helped to dissipate the tinnitus. He questioned whether, in a general way, sufficient attention was directed to the prevention of deafness. He thought that every case of catarrh should be looked upon as a potential case of deafness, and steps should be taken to deal with the catarrh, whatever it was due to. Contributory causes, such as a damp house and unsuitable climatic conditions, should be investigated.

Mr. W. S. THACKER NEVILLE dealt with chronic deafness. In his experience, chronic deafness had been due to chronic suppurative otitis media, chronic catarrhal otitis media, and otosclerosis. The catarrhal form he had treated with the inflation of hot air, by insufflations with oil of turpentine and balsam of Peru, by massage of the tympanic membrane with an electric motor, by diathermy and by ionisation. In chronic suppurative otitis media he had safeguarded the hearing with ionisation with zinc sulphate. For polypus he had used electrolysis with two needles, and crystals of chromic acid. Lipiodol he had recently used as a local application, as it was shown to enter the mastoid cells via a tympanic perforation. By these measures he had improved hearing without doing a mastoid operation. He [illegible] hearing was often improved by removing [illegible] operating on the nose for sinusitis, to [illegible] focus. Until this and such steps as [illegible] septal deviation to allow of catheterisation, removal of adenoids and dental sepsis had been carried out, the physical methods he had mentioned should not be considered. He had successfully used diathermy according to the technique of Lerroux-Robert, and Hollander and Cottle for what seemed to be hopeless deafness. One electrode was placed on the mastoid, the other on the cheek; this caused a rise of temperature amounting to 2° or 3° in the tympanic cavity within five minutes. Low voltage and low frequency were recommended so as to cause a deeper penetration of heat. This appeared to augment the blood-supply to the part and so hastened the absorption of effusions. Lerroux-Robert placed electrodes in the meatus as well as on the mastoid. The last-named *said that diathermy was indicated in cicatricial* otitis following suppuration and in adhesive otitis following an acute catarrhal otitis with calcareous deposits. For chronic deafness, but especially for improving tinnitus, he used the Zund-Burguet apparatus, and ionisation with sodium salicylate applied by means of the negative pole. He described the treatment and results in ten cases.

Dr. DAN MCKENZIE gave an account of his experiences with medical diathermy, and the intravenous use of collosol iodine. In the former, the amount of current passing rarely exceeded 500 milliampères; only that strength of current was used which caused a comfortable sensation of warmth. It was increased in strength from zero very slowly. If a deep aching was felt by the patient in the mastoid bone, it was probable that the temperature was too high. The cutaneous sensibility was the safest guide to the temperature of the deeper parts. The heating of the tissues in the path of the current was cumulative. Frequently an increase of the tinnitus was complained of directly after the sitting, but in most cases this was not an unfavourable sign. He gave an analysis of 46 cases which he had treated during the last 18 months, most of them being of the dry, progressive, middle-ear type. In five of them the deafness and tinnitus disappeared entirely after from two to six sittings. In another series of five great improvement followed the treatment, though they had been mostly long-standing cases—i.e., 2 and 9 months, and 5, 7, and 10 years. In general, 20 per cent. of these cases showed improvement. Of the remaining 36, 13 showed temporary improvement, but 21 did not show any, while in 2 the tinnitus was made much louder by the diathermy, and the patients declined to continue. He advised practitioners to watch for the onset of a continuance of deafness and tinnitus after colds in the head, influenza, &c., as well as after acute otitis media, and to submit these patients to diathermy in the early weeks of the symptoms. The intravenous injection of massive doses of collosol iodine was suggested to him 9 months ago by Dr. H. I. Shaheen Bey (Cairo), who had obtained good results from it in chronic dry deafness and tinnitus. From 6 to 13 ounces of collosol iodine was run into a vein once a week, as in blood transfusion. No shock, rigor, or pyrexia followed, neither did iodism. Patients could safely be allowed to return home after the injection. An objection to the treatment was that in two or three of the cases coagulation in the veins selected took place immediately after the injection. Until this could be avoided it must check any extensive trial of the remedy. Of the seven cases so treated, two were subsequently treated with diathermy also; one with definite and progressive improvement, the other with none. Of the other five, two showed improvement.

Discussion.

Mr. H. NORMAN BARNETT said the condition of the tympanum leading to middle-ear deafness might be due to: (1) long antecedent middle-ear suppuration; (2) infection from septic tonsils; (3) obstructed airway caused by deflection of nasal septum and enlargement of turbinals; [illegible] of the nasopharynx. He gave a [illegible] subject, contending that it was [illegible] to induce reabsorption of the products of chronic inflammation in the tympanum, and re-education of the dormant centre of hearing.

Mr. **ERIC WATSON-WILLIAMS** pleaded for a trial with parathyroid in the case of patients the subjects of otosclerosis. He had found grs. 1 to 2 of the dried extract very beneficial for them, though the dose recommended was usually only gr. 1/20, a quantity which was useless for this purpose. Some patients complained of an aching in the ears, others of flushing, following the treatment, but no serious disturbance had resulted.

Dr. **G. CATHCART** spoke of the success he had achieved with the electrophonoïde treatment.

Mr. **LOWNDES YATES** remarked that the vast majority of the cases of the kind under discussion showed an absence of wax. Patients having wax in the ears usually got well, but those without wax would require very prolonged treatment. Otosclerotics were found to be improved if their blood-clotting time could be brought down to normal.

The readers of the three opening papers replied, and the remainder of the meeting was devoted to the discussion of clinical cases.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.

Report of the Cancer Research Committee.

AN open meeting was held at the House of the British Medical Association on May 3rd, when an account was given of the work of the Cancer Research Committee of the Marie Curie Hospital, which Committee, until the project of a special hospital materialised this year, has been working directly under the auspices of the Association.

Miss **F. HUXLEY**, the President, was in the chair, and said that the principal speakers would be: Miss Maud Chadburn, surgeon to the South London Hospital, to whose energy much of the success of the work was attributed; Dr. Elizabeth Hurdon, the research officer, working under a grant from the Medical Research Council; and Dr. Helen Chambers, who had long worked with radium at the Middlesex Hospital in association with Prof. Sidney Russ and had inspired the Association to organise a clinical research scheme on a scientific basis.

Miss **CHADBURN** said that the report to be submitted concerned the activities of the Cancer Research Committee and its clinical subcommittee between October, 1925, and March, 1929. Before work was started the Committee spent some time (1) in studying the radium treatment carried out in the Continental clinics; (2) in deciding on the technique to be adopted, and in designing applicators; (3) in collecting funds and obtaining the loan of radium. The clinical work had been carried on at four hospitals—the South London Hospital for Women, the Elizabeth Garrett Anderson Hospital, the New Sussex Hospital, and the Royal Free Hospital—by the women surgeons and gynæcologists on the honorary staffs of these hospitals. The actual clinicians working in coöperation numbered 18. Each hospital was allocated its day for the use of the radium and non-allocated days were shared as occasion demanded. The radium was conveyed to and from the hospitals by an officer appointed for the purpose, who also checked the amount of radium and number of containers. At all four hospitals the same technique, the same recording system, and the same follow-up system was used. This full collaboration and coöperation had been obtained by virtue of the facts: (1) that the technique was settled by the Cancer Research Committee of nine members, on which sat a representative of each hospital; (2) that all concerned met at frequent intervals to consider the results of treatment and the need of alterations in technique, and to receive reports of new work elsewhere; (3) that the research officer was an experienced gynæcologist, who gave her whole time to the work. She attended all radium insertions, had charge of the follow-up clinic, and kept the records. She also visited and reported on work in progress abroad. The research would have been impossible without this officer, whose salary was paid under a grant from the Medical Research Council, and who was in a position to place at the disposal of each member the experience gained at the other hospitals. At first (in 1925) only inoperable cases were treated, but the faith of the surgeons in radium treatment had gradually increased, and each year more operable cases had been treated. The desire to make the fullest use of the available radium led to the initiation of a scheme for centralising the work in one hospital. The Marie Curie Hospital, at 2, Fitzjohns-avenue, Swiss Cottage, would, it was hoped, be open to receive patients in August or September of this year. Here treatment of cancer in the rectum, breast, or other parts of the body, besides the uterus, would be undertaken. The hospital would be run (1) by its own board of management on which would sit representatives of the Boards of the coöperating hospitals; (2) by its medical staff, which would consist of a director and research officer, a pathologist, a radiologist, a physician from each of the four hospitals, and all the women surgeons and gynæcologists of the four hospitals. Miss Chadburn thought this would be the first example of a coöperating hospital. As to finance, the hospital would have to make its own way. There would be general and private wards, and public support was urgently required.

Results Obtained.

Dr. **E. HURDON** showed on the epidiascope coloured drawings, prepared from sketches and notes made by herself, of the lesions treated in some 20 healthy looking patients, who were present at the meeting; most of them had been under observation for more than three years after treatment for a growth deemed to be inoperable. She also showed statistics of the results obtained. Since five years had not elapsed since the clinic was started, these could not yet be compared with those obtained by other workers over this period. The total number of cases treated was 300, of which 266 were cancer of the cervix, 22 of the body of the uterus, and 12 of the vagina, vulva, or urethra. The immediate mortality was 0·3 per cent. Up to October, 1928, the total number of cases of cancer of the cervix treated was 191, of whom 130 were living. Recurrence was usually found to occur early, if at all, and patients who had remained well for three years were unlikely to relapse. Cancer of the body of the uterus was treated by radium only when operation was contra-indicated, technically impossible, or refused by the patient. Supplementary radiation by means of large amounts of radium (4 g.) or deep X ray therapy promised to give an increased percentage of cures. In conclusion, Dr. Hurdon said that in operable cases (early lesion limited to the cervix) the results of radium treatment were about equal to those obtained by surgery; in borderline cases (extension of disease beyond cervix, invading vagina or parametrium, but without fixation) radium appeared to be the best method; in inoperable cases (involvement of surrounding tissues with fixation) surgery had nothing to offer, while 40 per cent. or 50 per cent. of such cases were greatly benefited, and some even cured, by radium.

Technique.

Dr. **HELEN CHAMBERS** described the technique used, which was a modification of that adopted by Heyman in Stockholm. She explained the principles on which the radium tubes were arranged for cancer of the cervix; in the uteric cavity two tubes were placed in tandem, and in the vaginal vault three flat boxes, so that the walls of the vagina were stretched apart laterally. The experimental work done under the direction of Prof. Russ at the Middlesex Hospital had established the range of action of a definite quantity of radium, and this had made it possible to devise a scheme whereby in cancer of the body the tubes in the uterine cavity could be reinforced where required and the vaginal walls allowed to remain slack, whereas for cervical cancer where the parametrium might be involved a wider area of irradiation was needed at the base of the pelvic floor, and the walls must be stretched laterally by applicators of a suitable size. These must be packed into position by cotton-wool, since if they were allowed to slope towards rectum or bladder fistulæ might result. The range of action did not always extend to the glands in the parametrium. If these were affected their local application should be supplemented by radium at a distance, or by deep X ray therapy, which should not be postponed too long.

Discussion.

Dame **Louise McIlroy** praised the organisation of the clinic. In her view it was important for the surgeons to work with a radium officer like Dr. Hurdon, who could advise as to dosage and technique. Team-work was essential to success. Women were more likely to come early for advice if they expected to be treated by radium instead of by operation, and this was most encouraging.

In the absence of Miss E. Bolton, Miss **Morna Rawlins** gave some account of the relief given to advanced cases in the Elizabeth Garrett Anderson Hospital by radium.

Miss **Louisa Martindale** spoke of the X ray apparatus now installed at Geneva, Freiburg, and The Hague. At Frankfort 10 extensive X ray therapy plants were installed in connexion with surgical departments. It was becoming recognised that X ray therapy was needed to supplement radium therapy.

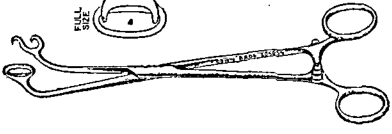
Mr. **Malcolm Donaldson** congratulated the Committee on the team-work and on the proposed new centre. More large centres were required, and he hoped that before long another would be established. The time of exposure was an important factor in the results obtained. At St. Bartholomew's Hospital glands were now being treated: (1) with X rays, (2) with intra-abdominal radium. The last-named technique had been started years ago, but discontinued owing to the production of ventral hernia in some cases. But since of 13 cases so treated in 1923–24 six cases were alive five years after treatment, and one case four years after, the technique was worth reconsidering.

Mr. A. **Palmer**, Dr. **Florence Stoney**, Dr. **Catherine Chisholm**, and Lady **Barrett** also spoke.

New Inventions.

A NEW TONSIL-HOLDING FORCEPS.

Many more enucleations of tonsils are now being performed, and with experience the surgeons find two varieties of tonsil which are hard to hold whilst enucleation is taking place. The first is the big, very soft, spongy, and friable tonsil; the second the retracted and buried tonsil, often very septic and adherent. The forceps here illustrated will, I hope, overcome both these difficulties. The length, the curve, the area of the grip, have all been carefully calculated in order to obtain a quick, firm hold.



The instrument is made by Messrs. Down Bros., Ltd., St. Thomas's street, London, S.E.

Harold E. Rawlence, M.D., F.R.C.S.

Reviews and Notices of Books.

Health, Disease, and Integration.

By **H. P. Newsholme**, M.D., F.R.C.P., D.P.H., M.O.H., City of Birmingham. London: George Allen and Unwin. 1929. Pp. 327. 12*s.* 6*d.*

The ancients did not doubt the importance of mind and spirit in causing diseases of the flesh, and long after demons had been discarded Lind's acute analysis of the data led him to look upon melancholy as a clear cause of scurvy. But with the progress of modern medicine these ill-defined ideas of ætiology gave way before the prim precision of theories of poisons and bacteria and such *like*; anything savouring of mysticism became abhorrent in the materialism of the nineteenth century. A good many people think that medicine still needs to be purged of much that is vague and indefinite, but, as usually happens, the pendulum probably swung too far and the psychological element in disease was undeservedly neglected in formal medicine. That some such element exists is, of course, plain to every observant man, and it plays a considerable part, unrecognised, in actual practice.

Dr. Newsholme has been so impressed by it that he has tried to imagine some scheme by which the materialistic causation of disease may be brought into line with the obvious fact that man consists of mind and spirit as well as body. He finally concludes that the education of the individual and the community should be directed at the spiritual and the material as one indivisible whole. With this few thoughtful sanitarians will want to disagree. But it is, we confess, a little difficult to follow the progressive steps of his argument or, indeed, to be sure that in places there is any coherent argument at all. Dr. Newsholme has a lively imagination and, as he confesses, only a moderate knowledge of the technical details of the many topics with which he engages. He lets his imagination loose at considerable length, and the result will, no doubt, irritate those who like hard facts. And some of his details are certainly open to criticism. The book opens where his own mental pilgrimage began—with three cases of lethargic encephalitis in the genesis of which violent emotional disturbances seem to have had some share. He bluntly says that he thinks it possible that some examples of this disease may actually be so caused, and he speculates on the possibility that the virus of encephalitis may be generated from nervous tissue by intense emotion de novo. It may be so. The critic will say that there are no controls dealing with the relation of emotion to other diseases and to health, that there is no certainty that the cases he quotes were encephalitis lethargica at all, and that if they were the facts are better explained as coincidences. His detailed discussion does not do much to strengthen his case. He accepts Levaditi's interpretation of the experimental aspect of the disease and writes as if it could readily be transmitted to animals: it is, in fact, not quite certain that this has ever been done, and the great majority of observers have certainly failed to do it. On pp. 57 and 212 he confuses labial herpes with herpes zoster (though it is true that Morris, whom he quotes as his authority, seems to do the same). A little later (p. 62) he says that the "introduction of a foreign colloid into the system is followed . . . by . . . a production of antibody to the colloid," and that antibodies act like enzymes—statements which are unintelligible or untrue.

Through the book anabolism and katabolism run about like a pair of goblins. Along such lines there is much that may be criticised, as we suspect the author would readily allow, and we think he would have been more convincing if he had not tried to find so much material basis for his idealism. But, taken as a whole, the book is worth while. It is quite time that the precise relation of parasites and especially viruses to diseases should be critically re-examined, that the question whether diseases are adequately defined by their ætiology should be further considered, and that pathology should recognise that man is something more than flesh. Dr. Newsholme preaches a doctrine which, in its application to hygiene, is perfectly sound, and he has raised a number of important and interesting problems; some of them are probably soluble.

SURGICAL RADIOLOGY.

By A. P. BERTWISTLE, M.B., Ch.B., F.R.C.S. Edin., late Resident Surgical Officer, General Infirmary, Leeds. London: J. and A. Churchill. 1929. Pp. 142. 8s. 6d.

THIS useful book gives outline descriptions of surgical diseases, summaries of such X ray examinations as may be carried out to elucidate diagnosis, and accounts of the appearances seen in the X ray photographs with their import. The book is of a size convenient to handle, though it deals with the whole field of surgery, and since the author has been at great pains to be accurate in his statements and is concise and informative there is every prospect of its success. The number of reproductions of radiograms is limited, but those interested can obtain abundant illustrations by procuring copies of the author's two atlases of radiography.

COLLOID CHEMISTRY OF PROTOPLASM.

Protoplasma-Monographien. Vol. I. By L. V. HEILBRUNN, Assistant Professor of Zoology, University of Michigan. Berlin: Gebrüder Borntraeger. 1928. Pp. 356. R.M.19.

THIS monograph constitutes Vol. I. of a series dealing very fully with the properties of protoplasm, and is an account of the colloid chemistry of protoplasm. The book is much more than a mere compilation. Prof. Heilbrunn, himself a distinguished worker in this field, states in his introduction that he has endeavoured to sift out the experimental evidence and where possible to indicate the lines of research which might prove profitable. As is to be expected with such a new branch of science, the volume consists mainly of an account of experimental work which throws some light on the behaviour of protoplasm. After some introductory chapters in which the microscopic appearance and morphology of protoplasm are considered, the author proceeds to give an account of methods of study. There follows a consideration of the physical properties of protoplasm, such as its viscosity, elasticity, and changes in its properties caused by differences of temperature, by various other physical factors, and salt solutions. The question of the electric charge of protoplasm is then discussed and the action on protoplasm of acids, alkalis, and fat solvents follows. The book concludes with a description of cell function and protoplasmic activity.

Prof. Heilbrunn writes in an interesting style and does not assume that the reader is already familiar with all the details leading up to the work described. The colloid chemistry of protoplasm is a subject which has only been developed during the last 10 or 12 years, but this book shows the remarkable amount of knowledge of the subject which has already been acquired. The author points out that the colloidal study of protoplasm is not easy. Observations must be made on tiny droplets of a material incompletely defined from a chemical standpoint, and probably consisting of a mixture of highly complex compounds. The results that can be obtained with such material must therefore be regarded leniently. The biologist cannot be expected to obtain data of the same degree of accuracy as those which the physical chemist can obtain with chemically pure compounds. But one must not be too lenient. If the colloid chemistry of protoplasm is to be a science, it must be based on firm facts and not on subjective impressions. The facts presented in this book, though they are not very numerous, show that a rational science of the colloid chemistry of protoplasm is possible and that it is now in the making. A bibliography of some 40 pages gives references of all the important papers dealing with this branch of the study of protoplasm.

SPASTIC CONTRACTURES.

Medizin in Einzeldarstellungen. Heft. 1: *Reflexmechanismus spastischer Lähmungen.* By Dr. Med. O. LEIBOWITZ. Bad Homburg v.d.H. Dr. H. Grossberger, Heidelberg. 1928. M.2.

THIS pamphlet of 40 pages represents the first instalment of a number of essays on Medicine.

In a short summary of the teachings of previous writers the author divides the numerous theories about spastic and especially hemiplegic contracture into two large groups, of central and peripheral centripetal origin. He points out the great differences as regards skin reflexes and contracture in the upper and lower extremities and discusses their significance.

ROENTGENOLOGY.

By G. W. C. KAYE, O.B.E., M.A., D.Sc.. F.Inst.P. London: William Heinemann, Ltd. 1928. Pp. 157. With 49 illustrations. 7s. 6d.

THIS small volume is essentially an expansion of the Caldwell lecture delivered by the author before the American Roentgen Ray Society in 1927. In this lecture the author dealt in detail with the various problems that arise in connexion with the protection of those who work with X rays. He has elaborated this thesis and now presents in a concise and permanent form a mass of information which is of great practical utility to all radiologists. In the appendix are included the recommendations of the British X Ray and Radium Protection Committee, which have now been accepted by the Second International Congress at Stockholm as the International Standard. The rest of the book is largely an explanation of how and why these recommendations were arrived at. The author gives a short historical summary of the development of radiology and two excellent chapters on the nature of radiations. These are followed by chapters showing the way in which the principles of protection can be turned to material account for the safety of workers. One criticism that we have to make of this small volume concerns its title, which is misleading, since the ground covered is only a small section of the physical side of this vast subject.

JOURNALS.

THE WORLD'S HEALTH.—The current number of this review, issued by the League of Red Cross Societies, appears this month in a new guise, for it is produced experimentally in an altered shape, and it is to come out quarterly (at 2s. each number), not monthly as hitherto. It deals with all the activities of the Red Cross, not only in war but in peace, when it prevents disease and in addition devotes itself to relieving great calamities. So the articles are concerned with a multitude of very various interests, the teeth of the school child, maternal mortality, nursing education in China and the Far East, with leprosy in the countries bordering on the Pacific Ocean, and with the communications between the Junior Red Cross societies of various nations. The photographs of Japanese leper asylums that are reproduced show how beautiful are their surroundings, and those of patients engaging with enthusiasm in organised games and recreations reveal the care and kindliness that are enlisted in their service to make segregation within the settlements as little irksome as may be. That is largely the purpose of the magazine, to show to all what is the best that other countries are doing. Thus standards are being raised all over the world.

THE LANCET.

LONDON: SATURDAY, MAY 11, 1929.

HEALTH OF THE MERCHANT SEAMAN.

A National Conference on the Health and Welfare of the British Merchant Navy at home and overseas was held at the Royal United Service Institution, Whitehall, on Friday last, May 3rd. The Conference was organised by the British Social Hygiene Council and the British Council for the Welfare of the Mercantile Marine, and should be useful in bringing before those who are immediately concerned the fact, often insisted upon in these columns, that the care of the mercantile marine in these directions has not been of the standard which is recognised as necessary among other sections of the population. It must be said, and with great pleasure, that the apathy, which was a marked feature in the situation until recently, has now disappeared, and that owners are wishful to follow in every direction where they can the opinions of medical and sanitary advisers. Further, their difficulties in doing so are now widely recognised, the necessary environment of seamen, whether on water or land, being one where the rules of health are exceedingly hard of application.

The principal discussion at the Conference turned upon the morals of the seamen, and it must have become apparent to the audience that the provision of suitable accommodation and chances of recreation at ports proved no sufficiently attractive alternatives with large sections of the men to diversions where the risks of venereal infection would be run. The sense of the meeting was that, while reading rooms, opportunities for indoor and outdoor sports, and the provision of instructional films were all to the good, they are not effective yet, if ever they will be, as measures for the prevention of venereal disease, so that practical attention must constantly be directed to the checking of dissemination and rapid treatment. As recently as April 5th of this year, at a meeting of the Medical Society for the Study of Venereal Diseases, reported fully in our columns on April 13th, a discussion on these questions was opened by Dr. H. M. HANSCHELL, medical superintendent and medical officer V.D. department of the Seamen's Hospital, London, and Dr. A. O. ROSS, V.D. officer of the City and Port of Liverpool. These observers pointed out from their large experience the risks run by seamen after promiscuous coitus, and at the same meeting Colonel L. W. HARRISON said that the only remedy lay in the equipment of ships for the modern treatment of venereal disease, with its implication that ships' doctors should be trained to use this equipment. At the Conference Dr. Ross stressed the point that chancroid was essentially an imported disease, and produced figures showing that quite one-third of all the venereal disease treated at the Liverpool clinics is imported from abroad. He pleaded for the examination of every seaman before every voyage, this examination being directed not only to the heart and hernial orifices but to the genitalia where simple examination would reveal acute disease if present. He testified to the impossibility of getting men on coastal trade to leave their employment in order to have treatment. Treatment of syphilis, he said, can usually be arranged for them, but in the case of gonorrhœa casual irregular treatment meant that cure remains for ever on the unattainable horizon.

The message which the Conference has delivered is that there must be facilities provided on shipboard for the treatment of venereal disease; preliminary examination, even if insisted upon, will not remove its incidence thoroughly. Nor is there any reason to suppose that owners would be otherwise than extremely eager to offer the full facilities demanded, but it must be pointed out that reforms along this line (which are already being introduced), while meeting the case in many prominent directions, could still leave out of count a large body of seamen whose avocations take them for extended periods away from land upon ships which carry no doctor. These men are deprived at the present of expert advice in the direction either of diagnosis or treatment. It is good that these things should be now commanding real attention, for publicity should pave the way to reform. And it would be better that there should be no more delay in the institution of working methods.

THE PROPOSED DIPLOMA IN PUBLIC DENTISTRY.

PUBLIC dental service has increased largely during the last decade. There is every reason to think that the future will see a still further increase of this branch of dentistry, and that a growing number of dentists will, at some period in their career, find employment in a whole-time or part-time capacity under public authorities. The dental treatment of school-children, while partly remedial, is concerned to an important extent with prophylaxis and prevention. Its value to the community, like that of the school medical service, is priceless, and it is essential for its officers to be highly trained and fully competent to carry out their responsible duties. There is at present keen competition for vacancies as school dentist and the appointing authorities have a wide range of candidates from whom to choose. Preference is naturally given to those who have had hospital experience, preferably as house surgeon in a dental hospital; but it must be remembered that dental hospitals are few and that only a minority of newly qualified practitioners can hope to obtain such experience. A large proportion of those appointed to the school dental service have had only a limited experience, and their knowledge of the particular problems involved in the dental treatment of children is necessarily meagre.

These considerations have spurred the British Dental Association to examine the case for the establishment of a diploma in public dentistry. The curriculum for qualification is already overloaded, but the student who does not propose to practise dentistry in private would surely welcome an opportunity of acquiring special training for public health work and would not grudge extra time devoted to this end. A well-planned post-graduate course leading up to an extra diploma gives not merely an academic hall-mark but a guarantee of such training as will enable technical skill to be used with the greatest advantage in connexion with the general health service of the community. The degrees in dentistry instituted by most universities do not meet the need, since the diplomate in dentistry who has not taken a university course from the beginning cannot proceed to a degree. The higher dental diplomas instituted by the examining bodies in Edinburgh and Glasgow are general in character and could scarcely be modified to provide a special course of the kind suitable for those engaged in public dentistry. A provisional syllabus for a diploma in public dentistry has therefore been framed by the British Dental Association and circulated to the various examining and licensing bodies for their consideration. It would seem a reasonable hope that, since the diplomas in ophthalmology and tropical diseases have admittedly been of service, a higher dental diploma would raise the standard of dental public health work and in the long run provide for a more efficient school dental service. So far, however, the response of the bodies to whom the proposal has been submitted, has not been propitious. The Dental Executive Committee of the General Medical Council consider that no sufficient case has been established for the institution of a diploma in public dentistry. A gleam of encouragement, however, comes from the University of St. Andrews, while other provincial universities are evidently giving the scheme sympathetic consideration. The provisional syllabus framed by the British Dental Association is, on the whole, well balanced. It provides for a period of study of not less than a year and includes courses in bacteriology, parasitology, the principles of public health and sanitation, epidemiology and vital statistics, oral hygiene, electrotherapy, and orthodontics. The practical syllabus provides for work under the supervision of a medical officer of health and a senior dental officer for not less than six months, and must include experience of the services organised for maternity and child welfare, venereal disease, and tuberculosis. Attendance at practical courses in orthodontics to be held at a recognised dental school is also necessary. The suggestion is that the examination, like that for the D.P.H., might conveniently be divided into two parts.

The scheme does not seem to us over-ambitious nor need the test be unduly severe. The objection that the dentist who does not possess a medical grounding might not be able to assimilate so miscellaneous a curriculum can be disregarded, since it is not intended to do more than to ensure that an officer concerned with one branch of public health should have a sufficient working knowledge of its other aspects. In two respects, however, the proposed curriculum might be strengthened. First, the practical instruction at a dental hospital should include not only orthodontics but also the general remedial treatment of dental disease in children, as contrasted with adults. Many special difficulties are encountered which the newly qualified rarely appreciate unless they have been warned. Secondly, since successful treatment of children requires not only a liking for them but also some knowledge of their psychology, the elements of child psychology might well form part of the course of study for a diploma in public dentistry. In private practice there is time to make friends with small patients, and most dentists soon acquire the art. But in school practice the difficult child may cause delay and disorganisation, and here some knowledge of modern ideas as to the probable causes of negativism and obstinacy may help the dentist to cope with an awkward situation. In our view the scheme outlined by the British Dental Association deserves consideration. It is designed to increase the efficiency of the school dental service and to make it easier to select suitable applicants for coveted posts. A properly planned diploma in public dentistry would not only enhance the prestige of the dental profession but would also strengthen the public health service of the country by promoting correlation between important branches of this service.

PELVIC DISPROPORTION.

AT the Congress of Obstetricians and Gynæcologists held in Dublin, reported on p. 999, interest in the first subject for discussion was well sustained throughout the day. Pelvic disproportion is indeed a subject of perennial interest and importance. It is doubtful, however, whether the practitioner will be able to disentangle from the views expressed any clear messages, apart from the vehement pronouncements against the use of forceps until the child's head is visible at the vulva. High-forceps and mid-forceps operations have been formally banished from obstetric practice and must not again figure in the obstetric literature and teaching of this country. Axis-traction forceps, with whose application and management the students of a generation only recently past were largely concerned, are to be regarded as obsolete instruments. Such an unequivocal and unqualified declaration of tactics, coming from many experienced obstetricians, and disclaimed by none, must certainly carry great weight. Probably more good than harm will result from this ban, and cases of "failed-forceps"—the nightmare of every obstetrician—will be less common. Still, we must bear in mind the fact, not sufficiently emphasised in the discussion, that malpresentations are a very common source of pelvic disproportion when both the pelvis and the child's head may be normal in size; and that of all the malpresentations of the head occipito-posteriors are the commonest. Indeed, in probably 35 per cent. of all cases the head of the child at the beginning of labour presents in this way. Spontaneous rectification usually occurs, but if it does not interference is desirable. Instrumental rotation is not now recommended by any responsible school, but most authorities agree that after manual rotation it is usually necessary to apply forceps to maintain the corrected position. This may be an unimportant exception to a sound general rule, but there are others of the same order, and they illustrate the danger in obstetrics of decrees that are too absolute. Undue dogmatism was exhibited also by certain speakers in regard to induction. Some agreed with the dictum of WHITRIDGE WILLIAMS that this procedure should never be performed; others were equally confident that it should be the method of choice in minor degrees of disproportion. But can the presence of minor disproportions be diagnosed with any certainty, and if so, by what criteria? It was argued that much depends on the moulding of the child's head, but too little was said about the chief factors concerned in this process—namely, the degree of ossification of the skull-bones, the force of the uterine contractions, and the strength of the accessory muscles employed during labour. In regard to the first of these factors, postmaturity is of the utmost importance, and is indeed a common cause of disproportion. It is the practice of one school to have an X ray picture taken of every patient who does not come into labour at the estimated date. If the child's skull is seen to be well ossified and if the centres of ossification of the lower end of the femur and head of the tibia are present, induction is immediately practised. It is likely that in this way a number of difficult labours are avoided. In the medicinal induction of labour—preferably by pituitary extract, since the efficacy and safety of quinine is in doubt—we have a safe method and one following which uterine contractions are likely to be augmented.

Another factor which may simulate disproportion or greatly complicate a difficult delivery is uterine inertia, of which little was said at the Congress.

Craniotomy and Cæsarean section have been performed for supposed disproportion on occasions when in reality uterine inertia was the cause of the trouble encountered, and many patients who have suffered a series of difficult labours have been found in later confinements to have inertia and have been relieved by the judicious use of pituitary extract. It emerged from the discussion that the procedure of choice in cases of pelvic disproportion is a "trial labour." It was generally agreed that in a well-equipped institution where the patient can be watched by experts, very little harm could result from a trial labour, and that many cases would be observed to terminate naturally, or at most after a low forceps delivery. But it was not stated with sufficient emphasis that a trial labour should never be allowed in a doubtful case in general practice. If the idea gets abroad that this is a proper method whereby to arrive at a decision as to the obstetrical possibilities of any given mother, the result will be a far larger number of emergency Cæsarean sections and craniotomies than at present. Moreover, the point of view of the prospective mother cannot be ignored, and it is unlikely that she would welcome expectant treatment which may involve distress of far longer duration than would induction or Cæsarean section. The avoidance of maternal injuries and disablement was not perhaps given enough prominence in last week's debates. Yet it is a subject of grave national importance as well as being the point where an obstetric case may be prevented from developing into a gynæcological one. In this connexion stress might have been laid on the association of the funnel-shaped pelvis (not at all an uncommon deformity) and perineal laceration. Owing to the narrowing of the transverse measurement of the outlet in this type of pelvis the head is compelled to shift backwards as far as possible towards the rectum and to be born with inevitable serious laceration. In most patients presenting complete perineal lacerations there is considerable narrowing of the transverse diameter of the outlet.

The subject of pelvic disproportion includes almost the whole of obstetrics, since nearly all difficulties are related to the primary one of delivering a living healthy child through a narrow passage without injury to the walls. It would have been impossible to touch on all its aspects in the time allotted, and the practitioner should be grateful for one piece of concrete teaching offered—the denunciation of high- and mid-forceps when used for traction alone. He is also likely to agree with the condemnation of the present method of conducting and staffing the antenatal clinics throughout the country. The general opinion was that supervision of pregnancy and antenatal examinations should be undertaken by the medical man or woman who is going to attend the labour. One of the first duties of the proposed College of Obstetricians and Gynæcologists might be the framing of an alternative scheme which would provide for this continuity of control.

THE OSLER CLUB.—On April 30th this club celebrated its first anniversary. Sir Farquhar Buzzard read a paper on the History of Neurology, in which he traced from their sources the different channels which have led up to the modern science, and prophesied a greater importance for neurology, in its widest sense, in the solution of social, and especially educational, problems. Mr. Falconer Madan spoke on Osler and Burton, and Dr. J. D. Rolleston gave a short sketch of the life and work of Theodor Billroth. Portraits and works of Burton and of Billroth and the club's collection of Osleriana were exhibited.

Annotations.

"Ne quid nimis."

THE PARATYPHOID OUTBREAK OF LAST SUMMER.

ABOUT the end of July last year five cases of paratyphoid fever were removed to St. James's Hospital, Balham, from a residential children's nursery in Streatham, and from there to one of the M.A.B. fever hospitals, when the infection had been identified by serological tests as paratyphoid B. A day or two later 15 cases of a similar illness were reported among well-to-do families in Kensington, and the London county health authority learned of an outbreak in Epsom somewhat earlier in which four children from two households had sickened within a few hours of one another after having consumed strawberries and cream. Many other cases occurred shortly after in the Western area of London and in the neighbouring parts of Surrey around Sutton, and inquiry revealed that most of the patients had partaken of cream purchased from retailers who obtained their supplies from one common source—namely, a large wholesale dairy. The circumstances of this outbreak were set out in our columns at the time, when it was pointed out that the outbreak showed no respect for age or class, was not closely localised to any one area, was characterised by abundant rose spots and a slightly enlarged spleen, and was not alarming in its severity although one death at least was reported. Dr. J. A. H. Brincker, senior medical officer to the London County Council, was deputed to collate all the available evidence so far as it concerned the County of London, and his report[1] to the Public Health Committee is now presented by Dr. Kay Menzies. From the first some article of diet such as cream was under grave suspicion of being responsible for the infection, and Dr. Menzies points out how the whole-hearted coöperation of all the medical officers concerned has solved the immense difficulty of tracking down the probable source of infection. The evidence for incriminating the cream of a particular wholesale dairy was cumulative. In London most of the proved cases (201 in number) of paratyphoid B developed their illness during the third and fourth weeks of July, and the same was true of the 219 proved cases in the home counties. It was clear therefore that the outbreak originated about the end of the first week in July, when, the weather being warm and fruit abundant, cream traced to this dairy had been freely supplied to the areas affected and had been consumed by the majority of the patients. In Kensington 41 out of 55 cases had certainly this cream, a proportion creating a high degree of presumption, for in investigations of this kind it is rare for more than half to be definitely ascribed to the suspected source of infection. A striking piece of corroboration was afforded by a Suffolk visitor who partook of strawberries and cream with a London friend on July 7th; both of them sickened of paratyphoid after a fortnight's interval. The evidence, however, remains presumptive only, for no paratyphoid organisms could be discovered in the cream when samples were taken three weeks after the infection had occurred; which does no more than suggest that the infection was of a transitory character such as would be produced by an intermittent carrier. The cream itself was derived from three principal sources, and definite evidence of contamination with the colon bacillus was obtained from two of these sources. The discovery of this gross contamination indicated that the cream must have been exposed to pollution at some stage of its production or in transit. No evidence of infection, after repasteurisation, by any employee of the firm could be discovered, and the explanation suggested is that contamination may have escaped the cordon of precautions during a rush period when there was an abnormal demand for cream. Although the evidence is thus incomplete the report is full of instruction as to the methods taken to track down the origin of an outbreak of this kind. The incidence of paratyphoid fever in London dates from the war period. It was anticipated that the return of overseas troops in 1918 and after would give rise to such outbreaks, for the micro-organisms of the Salmonella group may be carried by patients long after recovery and may be discharged by them intermittently over a long period of time. The previous outbreak of 1927 in Hertfordshire was traced to the infection of the milk-supply by two persons on a farm suffering from the disease in an unrecognised form. Modern sanitation and constant vigilance on the part of sanitary authorities have combined to keep in check the risks which are ever present. Happily the conditions favourable to the spread of the disease are generally absent when accidental infection by a carrier has occurred. An appendix to the report makes short work of the shameless capital made of this outbreak by some of those who wished to see the food regulations revoked, for it shows that the prohibited preservative could have had no effect whatever upon the growth of paratyphoid B; when the organism was implanted in cream even 4 per cent. of boric acid failed to prevent its growth.

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[1] An Outbreak of Paratyphoid Fever. Report by the Medical Officer of Health, London County Council. No. 2643. London: P. S. King & Son, Ltd., 1929. 1s.

THE LEGAL ASPECT OF STERILISATION.

A RECENT episode at the Old-street police-court may some day be hailed as the first tentative step towards the sterilisation of mental defectives by magisterial direction. A young man having been charged with drunkenness and assault, Dr. Williams, a member of the medical staff of the London County Council, stated that he had examined him and was prepared to make an order concerning him under the Mental Deficiency Act, 1913. The London County Council, he said, was prepared to place the young man in an institution. Upon request being made on behalf of the relatives that the accused should be allowed to remain at large, Mr. Clarke Hall, the police-court magistrate, answered that, if set at liberty, the young man might propagate other mental defectives. A brother gave the court an assurance that the accused would not marry. Even so, rejoined the magistrate, he might have children. At this point the representative of the relatives is reported to have asked the brother if he was prepared to have the accused "medically treated"—"medical treatment" apparently meaning sterilisation. The brother is reported to have answered in the affirmative, Dr. Williams observing that "it would be rather a new process in this country." After an adjournment the relatives were still anxious that the defendant should remain at liberty, but his mother was not prepared to agree to the suggested operation. The magistrate therefore made an order for his detention in an institution; "I do not want," said Mr. Clarke Hall, "to turn out this mental defective of low grade to produce other mental defectives." Upon this incident a learned contemporary, the *Solicitors Journal*, makes the comment that the suggested operation would be entirely illegal. "A doctor who performed this operation on a person mentally incapable of giving assent would, at the very least, be guilty of a serious assault or unlawful wounding; it may also be laid down with some confidence that, even in the case of a person capable of giving assent and doing so, the operation would amount to an assault in a country where the law forbids consent to that minor form of battery, with temporary instead of permanent result, known as the "knock-out."

If sterilisation is volunteered on behalf of the defendant to the magistrate as an alternative to detention and as a basis on which a charge shall be disposed of, it may seem strange that there should be any element of illegality. Evidently, however, the law as it stands to-day has its complications. One high authority on criminal jurisprudence lays down the principle that people have a right to consent to the infliction upon themselves of bodily harm not amounting to maiming. He explains that injuries short of maiming are not criminal at common law unless they are assaults, and an assault is inconsistent with the idea of consent. Maiming (or, to use the old legal term, "mayhem") has a technical meaning. To maim a man, according to Coke upon Littleton, "signifieth a corporal hurt whereby he loseth a member by reason whereof he is less able to fight—as by putting out his eye, beating out his fore-teeth, breaking his skull, striking off his arm, hand, or finger, cutting off his leg or foot—or whereby he loseth the use of any of his said members." Hawkins' Pleas of the Crown specially mentions castration as a maiming. The element of diminishing the victim's value as a soldier is interesting if anachronistic. It can even be suggested, as an academic thesis, that the person who consents to sterilisation is guilty of the criminal offence of self-maiming, because, in the language of the *Solicitors Journal*, "it may be suggested that the Sovereign is entitled to rely on his subjects to ensure their continuance." There is a statutory offence of wounding with intent to maim; under Section 18 of the Offences against the Person Act, 1861, it is punishable with penal servitude for life. A surgical operation, if it breaks the continuity of the outer skin, comes within the definition of a wound; but, so far as Section 18 is concerned, the prosecution must prove that the wound was inflicted "unlawfully and maliciously." As for operations upon a person incapable of giving consent, it is clear that a parent has a right to consent to an operation upon a child who is too young to exercise a reasonable discretion. And if a patient is in such circumstances as to be incapable of giving consent to an operation—e.g., if he is rendered unconscious by a motoring accident which makes it necessary to amputate a limb—it is not a crime to operate without his consent. But these propositions seem to presuppose that the operation is reasonably necessary for the saving of life or the repairing of bodily injury. As we indicated last week, certain American States have experimented with the legalisation of sterilising the insane, and the Minister of Health has said lately in Parliament that he thinks a proper scientific inquiry into the subject will some day be necessary. At present, however, he seems not to regard the matter as urgent. Our mental defectives are, he says, broadly the product of one-tenth of the population, and, out of that one-tenth, only one-tenth (or 1 per cent. of the whole) are themselves definitely defectives. The others may be unrecognisable as defectives, and thus sterilisation can scarcely be an adequate and final solution of the problem.

THE CICATRISATION OF WOUNDS.

IN the *Presse Médicale* for April 3rd Prof. R. Leriche makes some suggestive observations on the processes which normally lead to the cicatrisation of a wound. Why, when an incision is made into the tissues, processes of repair should immediately be set in action and the wound should heal has always been unexplained. The question has a practical as well as a philosophical bearing on the everyday work of the surgeon, for if the inner nature of these processes were known it might be possible to hasten repair and thereby shorten convalescence after operations. The suggestions put forward from time to time, such as Weigert's theory of the release of restraining tissue tension and the idea of a stimulus by the products of the digestion of damaged cells, have none of them been really satisfactory. It is scarcely credible that a simple modification of tissue tension should be capable of making connective tissue, stabilised for many years, return to an embryonic state. And as for the second hypothesis, a wound heals all the quicker by first intention when disintegration is reduced to a minimum; moreover, the normal changes happen at once, whereas proteolytic digestion takes considerable time. The phenomena seen in aseptic wounds—namely, dilatation of vessels, margination of leucocytes, diapedesis, proliferation of fixed connective tissue cells, return to an embryonic state, and formation of new vessels—greatly resemble those of inflammation, so that it is correct to speak of the reaction as traumatic inflammation. The connective tissue takes the principal part in this. Regeneration may begin, but contraction of newly formed connective tissue slows it down and stops it, and eventually cicatrisation takes its place.

Leriche draws attention to the points of similarity between these phenomena and those which follow every sympathetic section, whether it concerns the large rami, the ganglionic centres, or the peripheral fibres. In each case there is active vaso-dilatation, hyperthermia, an increase in the amplitude of the pulse-wave, and a local leucocytosis. Indeed, every trauma, contusion, or wound can be regarded as a sympathetic injury which must be inevitably followed by an active vaso-dilatory action and an operative wound can be looked on as a series of sections of the sympathetic nerves which accompany the blood-vessels. In his view it is this hyperæmic reaction which leads to the changes in the connective tissue designated traumatic inflammation. In the hours which follow a surgical operation the local temperature is raised and it remains elevated for several days; Leriche has proved that this takes place after a radical cure of hernia, excision of the elbow-joint, a cold appendectomy, suture of a ruptured biceps muscle, and meniscotomy of the knee-joint. The hyperthermia is regional, but (particularly in the limbs) may spread for some distance from the site of operation. Locally he has been able to demonstrate a leucocytosis. Macroscopically the changes following surgical trauma are well known to all surgeons who have had occasion to intervene shortly after the first operation, for the wound is congested, there is a diffuse œdema, and a friability of the muscles. All these effects are seen after an operation upon the sympathetic, whilst Morpurgo has shown experimentally what a great influence the sympathetic innervation has upon the fate of wounds made in a rabbit's ear. After cervical sympathectomy he found that the wound will heal more quickly than a control wound on the opposite neurally intact ear. The hastening of repair after sympathectomy applies as much to epithelium and bone as to connective tissue. Another factor which plays an important part in the normal growth of tissues is the hydrogen-ion concentration in the tissue juice, the optimum pH lying between 7·4 and 7·8. Now sympathectomy and sympathetic section suppress the acidity of wounds and bring the pH back to the most favourable point.

These views on the healing processes, the result of a good deal of study, deserve careful consideration. Leriche has certainly formulated a hypothesis which suffices to explain, in some way at all events, the mysterious sequence of events after every surgical operation. There seems to be little doubt that section of sympathetic rami is one factor in the initiation of the healing process. More than this, he suggests that post-traumatic or post-operative hyperæmia may be the cause of the favourable results obtained by laparotomy in tuberculous peritonitis, or the curious amelioration of symptoms which explorative laparotomy so often brings about in cases of inoperable carcinoma of the stomach. On this hypothesis the gastric mucosa, formerly anæmic, hypopeptic and hypoacid, becomes congested for a few days, furnishing a gastric juice richer in pepsin and hydrochloric acid, and from this arises the subjective impression of cure.

THE FREQUENCY OF UNDETECTED CANCER.

THE accuracy of cancer statistics is considerably impaired by the still appreciable proportion of cases in which cancer is overlooked as a cause of death, and, on the other hand, by the cases wrongly diagnosed as malignant. An interesting contribution to this problem is made in *Norsk Magazin for Laegevidenskapen* for April by Dr. F. G. Gade, who prefaces an account of his own investigations with a summary of the observations of others. As he points out, Lubarsch's study of 86,216 necropsies in various German hospitals included 8557 cases of cancer, among which there were 1131 cases (13 per cent.) in which the correct diagnosis had not been made before death. In a still more recent work, dating from 1928, Kranzfeld, of Odessa, found that 15·8 per cent. of the cases found to be malignant post mortem had been overlooked. During the 20-year period 1908–27 the Norwegian Committee for Cancer Research, Dr. Gade's offspring, made a special study of the malignant post-mortem findings of the pathological laboratory of Ullevaal, Oslo's communal hospital. Among the 1618 necropsies on malignant cases (850 men, 768 women), which included 211 cases of sarcoma, there were 183 (11·4 per cent.) in which the malignant disease had hitherto been overlooked. This percentage of overlooked cases compares favourably with the German and Russian figures. But in 1915 it was as high as 29, and in 1926 as low as five, the average for the last half of the 20-year period being 8·4 per cent. A remarkable inequality in the sex distribution of these undetected cases was observed, as great a proportion as 67·8 per cent. being males, although the comparative incidence of malignant disease in males and females in Norway is as 52·5 to 47·5. The average age of the persons whose malignant disease had been overlooked was somewhat higher than that of the persons whose malignant disease had been detected before death. Curiously enough, there was only one case on record in which a diagnosis of cancer (of the rectum) was proved post mortem to be incorrect, but Dr. Gade assumes that several similar cases must have escaped record. The most common diagnosis in the cases of overlooked cancer was "debilitas senilis." Another category which must include many cases of cancer comes under the heading "deaths from unknown causes." In the north of Norway (Finnmark) 16·7 per cent. of all the deaths in 1925 were placed in this category. Assuming that the incidence of cancer is quite as high in this group as among all the deaths from known causes, Dr. Gade calculates that if the deaths from unknown causes be assumed to represent 2·7 per cent. of all the deaths in 1925, and an addition be made of 12 per cent. of the notified cases of cancer, to make good the proportion of overlooked cases, then the return of cancer deaths in this year ought to be increased by 489, from 3259 to 3748—i.e., a supplement of 14·7 per cent. Calculations such as these show that, high as are the figures indicating the mortality from cancer during recent years, it is still seriously underestimated.

THE CASE FOR OPEN-AIR SCHOOLS.

THE recent decision of the Hornsey Town Council to defer for two years a well thought-out scheme for establishing an open-air school has led to the public discussion of a matter which is of considerable importance to the educational and public health authorities as well as to the pockets of the ratepayer. Unable to reach unanimity last October the Council postponed its decision for its newly appointed medical officer of health, Dr. R. P. Garrow, to report on the scheme. Dr. Garrow was able to draw on his special experience in Chesterfield where much advanced work has been done in modern school construction along open-air lines, and his adverse report on the scheme as drawn up was based on the following considerations:—

(1) The rapid evolution of the open-air principle in general schools.

(2) The steadily diminishing incidence of the chief crippling diseases.

(3) The fact that bad orthopædic cases can only be dealt with in residential schools and hospitals.

(4) The undesirability of segregating cripples.

(5) The desirability of centring effort in the child's home.

(6) The inadequacy of the suggested accommodation (120 places) to deal with the whole number of delicate children.

(7) The good social, economic, and healthy position of Hornsey.

As an alternative method of dealing with the situation in Hornsey Dr. Garrow suggests (*a*) the establishment of a fully organised orthopædic scheme; (*b*) rest-hours for certain children in the elementary schools; (*c*) a campaign to improve the parental knowledge of proper diet for children and the supply of one-third of a pint of milk daily to each child in school; (*d*) charting the weights of children in school for monthly or quarterly periods; (*e*) extension of facilities for open-air education in playground classes, school camps, and the like. In his opinion the cost of these suggestions would be negligible, while their adoption would be followed by results far superior in health and educational progress to any which could be achieved by the provision of 120 places in a special open-air school. There will, we think, be general agreement that the alternative measures would go a long way to meet the needs of the elementary school population and would result in raising the general standard of health and reducing the sickness-rate. But as Dr. H. B. Brackenbury, chairman of the Hornsey Education Subcommittee, pointed out to the Council, there are at present in the borough a number of delicate children, estimated at 150, who on account of physical defects were unable to get proper education in the ordinary schools. It is the duty of the education authority to provide for their schooling, and in Dr. Brackenbury's view the argument for open air in all schools does not rule out the case for special open-air schools in a place like Hornsey, where the buildings are not of a modern type. It would, in fact, be an economy to provide locally for the Hornsey children now in attendance at special schools of other authorities. The differences between Dr. Garrow and Dr. Brackenbury are not in principle, but in its application. Dr. Garrow remarks in his report that no reasonable person could doubt the value of open-air education, and he would no doubt himself be the first advocate for a special open-air school in a smoke-clouded, foul-aired industrial town with extensive slum areas where crippling and other social diseases are rife. In such a milieu the only possible course would be to place the school in a healthy open suburb and to transport the delicate children there. The modern general school on open-air lines can hardly enjoy the special curriculum, dieting, resting, nursing, and supervising arrangements of a special school. Nor can the crippled or delicate child keep educational pace and even mix in safety with his normal fellows. While the incidence of crippling diseases is undoubtedly decreasing, it must still be long before we can afford to relax our efforts for the physically defective children who are still with us in large numbers. Their supply in the future will be cut off by Dr. Garrow's alternative suggestions.

LABOUR BEFORE MEAT.

"LET labour go before meat" said Hippocrates. In his "Haven of Health," written for the guidance of Oxford students in the sixteenth century, Thomas Cogan quotes Galen in support of this precept, which he says "is inadvisedly neglected in the Schooles of Germany. For there the Schollers never exercise but foorthwith after meate, eyther leaping, or running, or playing at the Ball, or coyting, or such like. And the same abuse is rife among us here in England, both in the universities and in the grammer Schooles." Cogan's idea that under these circumstances the "meate is conveyed into all the members before it be concocted or boyled sufficiently" may have been inaccurate, but his conclusion not to exercise immediately after meat has certainly been endorsed by many experimenters. Adair[1] tells us that Dr. Harwood, professor of anatomy at Cambridge, took two pointers and fed them equally. He allowed one "to follow his instinct and sleep," while the other was kept for about two hours in constant exercise. Both dogs were then killed and it was found that in the stomach of the first all the food was digested, while in the stomach of the dog that had exercised the process had hardly begun. A physiologist in the University of Wisconsin has improved on this experiment with the aid of the "gastric pouch" devised with so much profit by Pavlov. By this method both the work done and the juices secreted were accurately measured.[2] It was found that while the animals exercised their gastric secretion was depressed, and the conclusion is once more drawn that rest after meals is to be desired. Despite the weight of all this evidence, however, we are loth to agree without reserve that post-prandial exercise is harmful; for there is a contrary observation which must have been made, consciously or unconsciously, by almost everyone. The healthy child on release from table after a heavy meal is only too often gripped by an irresistible impulse to run, dance, and mishandle furniture, to the surprise and indignation of adult beholders, who at such times value peace above all things. The same phenomenon (pace Harwood) may be seen among dogs. These clinical facts would not, of course, command any attention in face of the laboratory opinions quoted did it not so happen that their lesson has been verified by test-meal analysis. A group of workers at Guy's Hospital[3] last year published an account of experiments going to show that exercise which does not produce discomfort of any sort actually increases the rate of digestion, and this suggests that the scholars of Germany knew their own business better than Thomas Cogan. While in young men moderate exercise such as running two or three miles slowly after a light meal was found to delay digestion—though hardly perhaps as much as might have been expected—lighter exercise such as walking did not disturb the secretion of gastric juice and increased the rate at which the stomach emptied itself. Walking with a friend and talking caused more rapid emptying than walking alone, which was held to show the importance of psychological factors. The effect of emotion on digestion is indeed beyond dispute. "Better is a dry morsel and quietness therewith," says the author of Proverbs, "than a house full of feasting with strife." Pædiatrists rightly insist on this truth in the case of small children whose digestions may easily be upset by the over-solicitous attentions of nagging parents, but it is still insufficiently realised perhaps how prevalent emotional indigestion is among adults. This is a subject considered in a recent paper[4] by Alvarez, of the Mayo Clinic, who says he has made it his study since the time when as a boy, helping in his father's practice, he was first struck by its practical importance. He relates that early one morning a girl fell out of a mango tree and broke her arm. The doctor's office was at some distance and it was nearly noon before the patient arrived. With the first whiffs of anæsthetic she vomited, and there were the mangoes unscarred by digestion with the marks of her teeth clearly chiselled on the surfaces. On another occasion he was called to see a young woman who, on receiving a menacing letter from an income-tax collector, had taken to her bed and vomited day and night for a week. The treatment consisted in appeasing the Federal authorities with $3.85, and it proved wholly successful. The effect of emotion, Alvarez points out, may be an inhibition of the psychic secretion (appetite juice) in any part of the tract; in neurotic persons there may be hypertonic constriction of the gastric and anal sphincters similar to that causing hysterical "globus"; or in the same individuals there may be reversed peristalsis. In normal people an inhibition of peristalsis may result from mental stress, or if this is greater an increase of peristalsis. Finally lack of normal psychic interest may be as injurious as excessive emotion, and patients, he suggests, should be warned against eating "when absent-minded, mentally upset, or greatly fatigued." This is advice which could be very generally applied with profit, and to the Hippocratic precept we may add a codicil to the effect that between labour and meat a short interval of rest should intervene—such a pause being desirable not only to get over the inhibitory effect of severe exercise (if any), but also to restore emotional harmony and allow the mind to settle down as it should to enjoy the pleasures of the table. After the meal is over it is reasonable to suppose that we may safely obey our own internal prompting, whether this is to jump up and down on sofas or recline on them at full length.

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[1] Quoted by W. Kitchener, the Art of Invigorating and Prolonging Life, London, 1828, p. 109.

[2] Crandall, L. A.: The Effect of Physical Exercise on the Gastric Secretion, Amer. Jour. of Physiol, 1928, lxxxiv., 48.

[3] Campbell, J. M. H., Mitchell, G. O., and Powell, A. T. W.: The Influence of Exercise on Digestion, Guy's Hosp. Rep., 1928, lxxviii., 279.

[4] Alvarez, Walter C.: Ways in Which Emotion Can Affect the Digestive Tract, Jour. Amer. Med. Assoc., April 13th, p. 1231.

SEPTICÆMIA DUE TO BACILLUS FUNDULIFORMIS.

A GENERAL infection, due to an anaerobic organism hitherto supposed to be entirely saprophytic, is reported by Teissier, Reilly, Rivalier, and Layani.[1] The patient was a healthy male, aged 38, who was suspected of small-pox. He was taken suddenly ill with headache, backache, vomiting, and purpura. Later there was jaundice and generalised vesicular and pustular eruption. The coagulation time was prolonged—as was to be expected in the presence of jaundice—and there was no change in the blood picture. He died within a week. Lesions were almost confined to the liver which contained many abscesses; the biliary tract was nowhere involved, and the abscesses were confined to the parenchymatous tissues. Small abscesses were present in the kidneys. From the pustules during life, and from the blood, pure cultures of an anaerobic Gram-negative bacillus, recognised by the authors and by Veillon as *B. funduliformis*, were grown, and post mortem it was found in the hepatic abscesses. This organism was first identified by Hallé in the female genital tract, and has since been fairly widely found, but always saprophytically. It is not, as a rule, pathogenic to laboratory animals; but in this case it proved fatal to guinea-pigs and rabbits, always giving rise to hepatic abscesses on intravenous injection. The authors of this paper believe that the organism got through the intestinal tract into the portal blood, since it cannot live in the presence of bile, and did not infect the biliary passages. Their description is noteworthy, since cases of generalised infection with anaerobic organisms, whether of established virulence or not, are uncommon.

ENDEMIC AND EPIDEMIC MALARIA IN SOUTHERN RHODESIA.

Dr. J. Gordon Thomson has done notable work on malaria and blackwater fever in Southern Rhodesia, and in a paper read to the Epidemiological Section of the Royal Society of Medicine on April 26th he gave a further critical review of the malarial conditions in this attractive territory. The youngest of the self-governing Dominions, it is twice the size of Great Britain, and enjoys for the most part a climate well suited to white settlers. The census of 1926 showed an indigenous negro population of just under a million and about 39,000 Europeans. Since then some 10,000 new white settlers have probably been added. The country is a high plateau lying between latitudes 15° S. and 25° S.—i.e., within the tropics. Most of the whites live along the watershed running S.W. to N.E. at 5000 feet above sea-level. About a quarter of the entire area lies at 4000 feet, and there is much good agricultural land at 3000 feet above sea-level.

The work of Christophers has established that malarial hyperendemicity lies in the fact that while the adult indigenous inhabitant is tolerant to malaria and seldom suffers from an acute attack, the infants suffer for the first few years of life from acute malaria with numerous parasites in their blood, and a very high infantile mortality is the result. The survivors of this "acute infestation" gradually develop a tolerance to the parasite and acute attacks become progressively less frequent ("immune infestation"), till finally the adults are completely tolerant and seldom show parasites in the peripheral blood, although all are presumably infected with the parasite. In Southern Rhodesia hyperendemic malaria prevails with yearly seasonal epidemics among the non-immunes—namely, the indigenous negro children, and the whites of all ages. All these non-immunes live in a country where for about six months in the year the density of anopheline mosquitoes which bite man is high, and the atmospheric temperature and humidity are eminently suitable for the development of the malaria parasite in the common carrier *Anopheles gambiæ* (*A. costalis*). The hyperendemicity of malaria in Southern Rhodesia is shown by the fact that the enlarged-spleen rate in children is well over 50 per cent.; often over 90 per cent. in those between 2 and 10 years of age. Moreover, the parasite rate (endemic index) in the negro children is extremely high. The charted records of 1924–26 demonstrate that the amount of malaria varied from year to year directly with the rainfall; as the rains continue, so increases the number of cases of malaria and blackwater fever. The peak of the acute malaria incidence amongst the whites is in April; there is a quick drop in May and June with the onset of the cold weather, and it is interesting to note that Leeson reports that *A. gambiæ* appears first in late November and remains till early June, when it disappears.

Hyperendemic factors such as those operating now in Southern Rhodesia, and, moreover, associated almost entirely with the malignant tertian malaria parasite, make it plainly impossible for a non-immune white population to live there healthily unless they devote some intelligent, withal simple, effort to prevent malaria. But, in fact, carelessness and the stubbornness of ignorance lead to needless deaths and to much sickness from malaria among the white settlers, especially in the rural areas. Dr. Thomson, at first-hand experience, agrees heartily that "the attractions of Rhodesia are manifold and well-nigh irresistible, and to the right type of immigrant it offers a home well worth living in, and developing for future generations." But he emphasises that the settler must be of *the right type;* and clearly this means right-thinking about malaria and mosquitoes. He deplores the fact that to-day so many of the white settlers are as individuals apparently blind to the fact that prevention of malaria is for them a personal affair, and many of these blind resist enlightenment. No doubt in the process of development the disease will some day, in Rhodesia, be reduced to a minimum, where now it is of maximum importance. Meanwhile an intelligent settler in that country may protect himself and family from malaria by a well-constructed and screened house, with a strict and careful use of wide mosquito nets for the beds, by destroying mosquito larvæ in and around his living quarters, and especially by keeping negro children far away from his living quarters. Dr. Thomson points out that there are many white settlers in rural Southern Rhodesia to-day who live free from malaria by just these measures. These many might and should be many more.

MEDICAL DISPUTES AND LITIGATION.

"No practitioner is safe against becoming involved in very costly litigation arising out of his practice. This risk is one against which insurance should always be effected." So runs a sentence in the annual report of the Council of the London and Counties Medical Protection Society, and it may be taken as the moral of the many instructive stories which the report contains. No one would claim any novelty for the sentiment, since it is repeated monotonously every week or two in our own columns and elsewhere; yet a perpetual insistence on its truth is certainly justified by what the Society's solicitors describe as "the growing critical and litigious spirit of the general public." We are glad to say that the sensible plea for Safety First is having its effect, and that not far short of a thousand practitioners joined this particular defence society last year, bringing the total on Dec. 31st, 1928, to 11,492. That the subscription is a very small premium for the insurance afforded is an obvious commonplace, and no one can be blind to the advantage of belonging to such an organisation when faced with adverse damages of several thousand pounds. Not everyone, however, is aware of the large amount of assistance in everyday problems that the Society offers—an amount indicated by the fact that 1067 applications for advice were received from members last year alone. In considering the situations in which help is asked the solicitors, Messrs. Le Brasseur and Oakley, refer to the increase of cases arising under the National Health Insurance Acts and make the following outspoken comment:—

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[1] Paris Méd., March 30th, p. 297.

> "Dental surgeons are now exposed, in much the same manner as general panel practitioners, to that form of private but statutory jurisdiction falling within the almost inexhaustible powers of the Minister of Health. It is a matter of surprise to us that those responsible for watching the interests of the medical and dental professions, and bodies concerned in matters pertinent to these professions, are so powerless to prevent the growth of bureaucratic power which can usurp jurisdiction designed to give citizens the fairest form of trial, and can vest in one man, who by virtue of his statutory powers of making regulations can pass what are virtually laws affecting so large a number without their having a word to say antecedent to such regulations becoming effective, a power of decision and sentence without right of appeal."

Addressing the Society's annual meeting on May 1st Sir John Rose Bradford, F.R.S., the President, spoke of the loss sustained by the death of Dr. G. W. Hill and Sir Anthony Bowlby, vice-president and trustee respectively, and of Mr. A. Neilson, K.C., who had been "a tower of strength to the Society." In the course of observations of the risks of practice he drew attention once more to the advantages of radiography in providing evidence of fractures, and insisted that members should "take every precaution to safeguard themselves and their interests" in this kind of case. A statement had been drawn up, he said, of the steps which ought to be taken where foreign bodies were alleged to have been left behind at operation. "So much," he added, "of the work of our Society, and of the expenditure also, could be diminished if quite simple methods of procedure were adopted by the individuals concerned in such cases," and few who study the report carefully will spurn the Society's good offices or imagine themselves qualified to play a lone hand in the game of law.

SIR RONALD ROSS.

A TESTIMONIAL has been started to Sir Ronald Ross, and we understand that subscriptions will be invited immediately. The object is to set free from financial anxiety Sir Ronald and Lady Ross in their declining years, and the appeal will be directed to the public generally, who may be expected promptly to recognise the claim on their generosity furnished by Ross's magnificent work alike in the ætiology and the prevention of malaria.

LONDON CLINIC AND NURSING HOME.—The share capital necessary for the prosecution of the scheme to erect an institution for paying patients containing 175 beds with full facilities for diagnosis and treatment on a site between Devonshire-place and Harley-street has now been acquired. Details of the organisation and an elevation of the proposed building were set out in THE LANCET, 1928, ii., p. 729, 783. The work of demolition of existing buildings on the site has commenced, and it is hoped that the Clinic will be ready for use early in 1931.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XXX.—THE CLINICAL SIGNIFICANCE OF THE BLOOD-PLATELETS.

PART I.*

IN view of the great importance attached by clinicians and pathologists to blood examinations as an aid to diagnosis, it is a curious fact that so little attention has been paid to the blood-platelets. The explanation is partly that the technique of examining blood-platelets is more difficult than that of the other cellular constituents of the blood. The main reason, however, is that ever since their discovery 50 years ago, the majority of physiologists have, on quite inadequate grounds, dogmatically denied their existence as independent cellular elements, so that relatively little is known concerning their physiological and pathological significance. It is only during the last 15 years that interest in them has reawakened.

There are two processes of importance from the clinical and pathological standpoint in which the blood-platelets play a part of outstanding importance—blood coagulation and thrombus formation. In fact, these processes cannot be understood if the existence of the platelets is denied. The voluminous and confusing literature on blood coagulation bears eloquent witness to that statement. Recent work has shown that, in addition, platelets play a part in the defence against infection by micro-organisms.

It is impossible to understand the significance of changes in the platelets under pathological conditions or even the technique of investigating them without a knowledge of their physiological properties and functions. A very brief summary of our present knowledge on these points must therefore be given.

Properties of Platelets.

Platelets are minute discoidal particles of living protoplasm possessing a definite structure and amœboid movement. They vary slightly in size, their largest diameter being less than half that of a red corpuscle. They are present in normal blood in definite numbers which vary within certain limits in different individuals of the same species. In man their numbers vary between 250,000 and 400,000 per c.mm. They have a characteristic property which determines their function. When they come into contact with a water wettable surface larger than their own they attach themselves to it and spread out over it. In doing so they disintegrate in an explosive manner and shed into the blood a coagulating agent. This coagulating agent, which is not identical with either "thrombin" or "thrombokinase," is capable in the presence of calcium salts of transforming fibrinogen into fibrin with the formation of thrombin (fibrin ferment). If the water wettable surface is smaller than that of the platelets, as is the case, for instance, with colloids or many micro-organisms, they attach themselves to it without disintegrating, so that masses of agglutinated platelets are formed which settle in the liver, the spleen, and the bone-marrow. If removed from the body, even if allowed to remain in blood or plasma, the platelets eventually die. In doing so they contract and get agglutinated to one another. It is important to note that this manner of death of the platelets differs from the disintegration by expansion, referred to above, in this important point that the coagulating agent, liberated when the platelets disintegrate by expansion, is not liberated or liberated only in much smaller amounts when the platelets die in the contracted state. Another important point is that the characteristic disintegration of platelets on a water wettable surface is dependent inter alia on the presence of ionised calcium in the blood. In oxalated or citrated blood the platelets do not disintegrate when they come into contact with a water wettable surface. Lastly, the disintegration of platelets liberates a substance which has a very definite vaso-constrictor effect. These properties of the platelets give the clue to their function in blood coagulation, thrombosis, and in infections.

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* Part II. will appear next week.

Pathological Significance of Platelets.

1. *Blood Coagulation.*—In the past a fundamental difficulty in explaining blood coagulation has been that blood keeps fluid as long as it remains in the blood-vessels and clots when it is shed. If one denies the existence of the platelets one is compelled to assume that blood when shed undergoes either a physical or a chemical change. Both views have been held. There exists a vast and confusing literature dealing with this point and involving many complicated hypotheses. The phenomenon is readily explained by the characteristic property of the platelets.

The endothelium of the blood-vessel walls owing to its richness in lipoids presents a surface which is not wetted by water, as one can readily verify. The platelets therefore remain unaltered in the intact blood-vessel. When a blood-vessel is cut, the blood flows over the water wettable surface of the wound-tissue to which the platelets attach themselves. This causes them to disintegrate and to shed into the blood their coagulating agent which, by the formation of fibrin from fibrinogen and the production of thrombi, causes the blood to clot. The same happens if blood is allowed to flow through a glass cannula into a glass vessel, even without coming into contact with the wound: the blood clots. In this case the glass presents the water wettable surface. A paraffined or oiled glass cannula or glass vessel is an imitation of the endothelial lining of the blood-vessel in so far as it presents a non-water wettable surface, and thus prevents the disintegration of platelets and the clotting of blood. If blood is removed from the body in such a way that the disintegration of platelets is completely prevented and if, then, by suitable manipulation the platelets are completely removed by filtration, no spontaneous clotting ensues even if ordinary glass vessels are used. If the removal of the platelets is only partial, as, for instance, by spinning, clotting is delayed roughly in proportion to the removal of the platelets.

If we restrict our attention to blood coagulation as it occurs in the body, which is after all that aspect of the problem which interests the clinician and the pathologist, the process is seen to be dependent *primarily on three main factors: the blood-platelets,* fibrinogen, and calcium salts. The relation of the platelets to blood coagulation can be summed up briefly in the following two laws of blood coagulation.

1st Law.—No coagulation of blood without disintegration of platelets.

2nd Law.—Everything that facilitates the disintegration of platelets facilitates the coagulation of blood. Everything that retards or prevents the disintegration of platelets retards or prevents the coagulation of blood.

This statement does not preclude the existence of other processes which may assist in the coagulation of blood such as the addition to the blood of coagulating substances by the tissues of the wound. Such processes are, however, subsidiary and not essential to blood coagulation, *since blood will coagulate even if every contact* with other tissues is carefully avoided.

2. *Thrombosis.*—Thrombosis begins, as a rule, as a mass of agglutinated platelets adhering to the damaged wall of a blood-vessel—usually a vein. It can be elicited by pathological changes in the endothelial cells, or by producing a slight injury to the endothelial lining of the blood-vessel, for instance, by pressure or by firmly tying a blood-vessel. As more and more platelets attach themselves to the original mass of agglutinated platelets, the thrombus *of platelets—a "white thrombus"—increases in* size, impeding the blood flow. If now some platelets, in attaching themselves to the white thrombus, are disintegrated and liberate their coagulating agent, there is a local formation of fibrin and a "red thrombus," which is actually a blood-clot, appears superimposed upon the "white thrombus" of agglutinated platelets. It is probable that an impeded blood flow plays an important part by preventing the liberated coagulating agent from being washed away.

Infections.—It has already been stated that the platelets attach themselves to certain types of bacteria when they are introduced into the blood stream and agglutinate them. This process is, therefore, one of the methods by which the blood tends to keep itself sterile.

Formation and Destruction of Platelets.

The view generally held is that the platelets are formed in the bone-marrow and are destroyed in the spleen. Their formation is believed by some to be referable to the megakariocytes alone. Their destruction is attributed by some to an action of the reticulo-endothelial system—generally including the spleen.

One of the writers (W. C.), working with A. H. Drew, has obtained evidence of the formation of platelets by the endothelial cells of the blood-vessels. Such a view would explain that an antiplatelet serum which on injection elicits purpura hæmorrhagica produces this effect not only by a lysis of the platelets, but also by damaging the capillary endothelium.

The formation of platelets is stimulated by irradiation with ultra-violet light and with small doses of X rays and radium. Animals kept in darkness for a long time show an abnormally low platelet count, which rises to the normal on irradiation with a mercury-vapour lamp. There is some evidence that excessive irradiation with light may have *a destructive effect, but this point requires further* study. Radiation with radium and X rays in large doses has a destructive effect on the platelets so that a thrombopenia is produced. Operative procedure is followed by a transient rise in the number of platelets which reaches its maximum in the second week after the operation and then falls again to the normal level. After removal of the spleen, an organ in which the platelets are believed to be destroyed, the post-operative rise persists for a longer period.

Technique of Platelet Count.

The following method of counting blood-platelets has been found satisfactory.

A syringe, of 1 c.cm. capacity, and preferably of the tuberculin type, is mounted with a needle whose bore is not too *narrow; it is sterilised by repeatedly drawing into it* and expelling liquid paraffin, heated well above the boiling point of water. Into this syringe is drawn 0·2 c.cm. of 3·8 per cent. solution of citrate of soda; then 0·8 c.cm. of blood are taken from a vein fairly rapidly. In this way the blood traverses an anticoagulating surface into an anticoagulating medium. *The blood is diluted in the proportion* of 4 parts to 1 part of citrate, and can be used not only for determining the ratio of platelets to red corpuscles, but also for making absolute counts of red and white corpuscles, the appropriate correction being made according to the dilution with citrate; the blood is also suitable for the sedimentation test. For *counting the platelets* a teated pipette is used to mix a small quantity of the blood on a paraffined slide with about 10 times its volume of the following solution:—

Sod. citrate	0·2 g.
Sod. chloride	0·8 g.
1 per cent. brilliant cresyl blue	1·0 c.cm.
Formalin	2·0 c.cm.
Dist. water to	100·0 c.cm.

A droplet of this mixture is placed on a clean microscope slide; this is inverted over a clean coverslip which it picks up, and the preparation is immediately sealed with hot liquid vaseline. With a 1/12 in. oil-immersion objective and an eyepiece containing a squared diaphragm, successive fields are examined until 50 platelets and the accompanying red corpuscles have been counted. An ideal field will contain about 30 red corpuscles; the normal red corpuscle-platelet ratio in man is about 16 : 1. The absolute number of platelets is obtained by dividing the ratio found into the number of red corpuscles per c.mm., as determined by a separate red cell count. In order to *conserve a uniform* relative distribution of red corpuscles and platelets it is essential to carry out the manipulations with rapidity. The presence of platelet clumps invalidates the count.

When a vein is not available the skin of the finger just behind the nail-bed is pricked through a droplet of diluent with the ragged end of a teated glass pipette whose interior is lined with paraffin. The blood-diluent mixture is transferred by the pipette to a paraffined slide where it is thoroughly mixed and if necessary further diluted; a droplet of this is placed on a slide and the red cell-platelet ratio determined as already described. The method is less good, and if there be any delay in obtaining the blood the platelet count is apt to be erroneously low.

Platelets in Disease.

The behaviour of platelets in disease is still an almost untilled field of clinical research. At present, therefore, a platelet count is more a piece of research than an aid to diagnosis and treatment. There are, however, several different groups of conditions in which a constant relationship with a change in the platelet count seems to have been definitely established, and these we propose to discuss next week.

W. CRAMER, Ph.D., D.Sc., M.R.C.S.,
Imperial Cancer Research Fund.
R. G. BANNERMAN, M.D., Ch.B.,
Pathologist, Miller General Hospital, London.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdr. P. J. Maguire is placed on the Retd. List.

The following appointments are notified: Surg. Lts. J. P. Henderson to *Vivid*, for R.N. Barracks, Devonport; and H. A. Clarke to *Pembroke*, for R.N. Barracks, Chatham.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Sub-Lt. D. C. Livingston to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS.

Maj. D. S. Buist is placed on the half-pay list on account of ill-health.

Temp. Lt. W. H. D. Priest resigns his commn.

SUPPLEMENTARY RESERVE OF OFFICERS.

Lt. I. S. Thomson to be Capt.

TERRITORIAL ARMY.

Capt. A. C. MacDonald to be Maj.

Capt. J. W. Archibald relinquishes his commn. and retains his rank.

Lts. H. J. Curran and A. L. Moorby resign their commns.

A. H. Weston (late Offr. Cadet, Edinburgh Univ. Contgt., Sen. Div., O.T.C.) to be Lt.

W. R. Sprunt to be Lt.

DEATHS IN THE SERVICES.

Surgeon-Commander James Walter Octavius Underhill, R.N., who died on April 29th, entered the Royal Navy in 1886, and two years later was appointed to the *Boadicea*, the flagship of Rear-Admiral the Hon. Sir Edmund Fremantle in the East Indies. Later he served in the Mediterranean, and in 1898 became staff surgeon. After serving in the North America and West Indies Station he was promoted to fleet surgeon, and subsequently retired in 1907. During the early part of the war he was P.M.O. of the *Excellent*, gunnery school, at Portsmouth. He was made surgeon-commander in 1918.

COLONIAL MEDICAL SERVICES.

Dr. G. H. Garlick has been appointed Physician and Radiologist, Johore; Mr. K. H. Uttley, M.O., Hong-Kong; Mr. J. W. Bowden, Mr. I. M. D. Grieve, Mr. P. G. Preston, and Mr. A. B. Swarbreck, M.O.'s, Kenya; Mr. W. C. V. Brothwood, M.O., Straits Settlements; Lieut. J. W. Walker, M.O., Tanganyika Territory: and Mr. J. McDaniel, M.O., Uganda. The following have been appointed M.O.'s to the West African Medical Staff: Mr. J. I. Lochhead, Mr. W. McLelland, and Mr. J. H. Young.

NAVAL VACCINATION ORDER.

In view of the prevalence of small-pox it has been decided to vaccinate all active service officers and ratings who have not been vaccinated within five years.

Special Articles.

MODERN CONCEPTIONS OF NUTRITION.

THE MAIN COMPONENTS OF THE NORMAL DIET.*

By STUART J. COWELL, M.B. CAMB., M.R.C.P. LOND.,
PROFESSOR OF DIETETICS IN THE UNIVERSITY OF LONDON.

THE foundation of our modern ideas of nutrition rests on the experimental work of the great French chemist Lavoisier, who first demonstrated, some 150 years ago, that the heat production of the body was due to the oxidation of food, and was in fact a phenonemon of the same order as combustion outside the body. He carried out a remarkable series of quantitative measurements of the variations of metabolic processes with the food eaten, the work performed, and the surrounding temperature, and was led to the then astounding conclusion that "life is a chemical function."

During the nineteenth century the chemical and physical aspects of nutrition were the subjects of laborious investigations at the hands of such masters as Magendie, Liebig, Voit, and Rubner on the Continent, and Atwater and Benedict in the United States. The crude chemical composition of foodstuffs was discovered, and elaborate determinations were made of the nutritive requirements of the individual in terms of the main components of foods—namely, proteins, fats, carbohydrates, and mineral salts—and in terms of the heat or energy exchange produced by the combustion of the several items within the body.

Towards the end of the last century it appeared almost as if the main problems of animal nutrition had been solved. Young animals could be successfully reared and maintained in good health when fed with nicely calculated quantities of apparently pure protein, fat, carbohydrate, and mineral salts, the chemical composition of all of which was more or less accurately known. What further great advances were possible? The man in the street began to talk about compressed foods, and cartoons were drawn illustrating dinner parties at which food was supplied in weighed blocks of pure foodstuffs. It is true that a word of warning was uttered by Pavlov, who pointed out the influence of the appetite-producing effect of food on its digestibility. Nevertheless it remained for one of the great biochemists of our own country to dispute successfully the proposition that protein, fats, carbohydrates, and salts were the sole essential constituents of a normal diet, and in so doing to pave the way to our modern views of nutrition which have done so much towards the prevention and treatment of human disease. I refer to the pioneer work of Sir Frederick Gowland Hopkins, who, by taking most careful precautions to purify all the constituents of the synthetic diets used by him, showed that young animals fed on such diets were unable to grow, although growth could be readily secured by adding to their diet a minute quantity of the natural food milk, which contained but negligible amounts of the then known food constituents. He postulated, therefore, the presence in milk of what he termed accessory factors in the diet. After a few years of controversy, his views were accepted universally and have led to enormous advances in the whole field of nutrition.

It would not be right to give the impression that all the recent advances in the science of nutrition had arisen from laboratory researches conducted by expert chemists. Careful observation, unaided by any facilities for strictly scientific experiment, had long ago led to such empirical discoveries as the protective influence of certain kinds of food against scurvy—though it was not until the disease had been experimentally produced and investigated in animals by Holst that anything like an adequate knowledge of the distribution of this protective factor was possible, and even then, neglect to take advantage of his experimental methods of investigation led during the Great War to the issuing as a scurvy-preventing agent of lime juice, which has virtually no protective effect against scurvy. Again, some 30 years ago, Eijkmann, who was then acting as medical officer to a prison in Java, observed that the fowls which were kept in the neighbourhood of his prison were frequently affected by peculiar paralytic symptoms which reminded him of those of the disease beri-beri which was common among the prisoners. The fact that these fowls and the prisoners were receiving the same kind of food led him to suspect a dietary origin for the disease, and subsequent careful studies by himself and his followers led eventually to the conception of diseases being produced by specific dietetic deficiencies.

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* Being the substance of the Inaugural Lecture of the Chair of Dietetics, delivered at St. Thomas's Hospital on May 2nd, 1929.

In recent years our knowledge of the fundamental processes of nutrition has been progressing rapidly along each of these two paths—chemical and physiological analysis and clinical observation. Knowledge for its own sake may be a fitting motto for the chemist and the physiologist, whereas the prevention and cure of disease must be the first aim of the clinical observer. In spite of their diverse aims the exponents of the two methods find that each has something to learn from the other, and there is some justification for a feeling of elation that by their combined efforts it has already been made possible for us to control by dietetic methods alone many diseases which formerly baffled our best-intentioned efforts.

The Complete Diet.

In order to understand the ways in which the composition of a dietary can influence the health of the individual partaking of it, we should first find out as much as possible about the physiological action of every constituent known to be present in each item of food composing it. Our knowledge of the chemical composition of foods is still far from complete, but I intend in this and my next lecture of this series to describe briefly some of the more important attributes of the known food constituents; the sum total of all essential constituents chosen in the correct proportions should represent a complete or perfect diet, always assuming that the foods containing them are presented in a palatable and digestible form and free from harmful substances.

To begin with, let us consider the significance in human nutrition of those food elements which have been recognised for the longest period of time—namely, the proteins, fats, carbohydrates, and mineral salts. It is customary to consider protein and salts as the main tissue-building elements of the diet, fat and carbohydrate being considered as energy-providing constituents. This conception may be of some value in practical dietetics, but does not apply to the physiological processes that go on in the living cell. Certain parts of the protein molecule may be split off into compounds which are used for the supply of energy and may even be stored as fat. On the other hand, fats, as has been stressed by Leathes, form an indispensable part of all living protoplasm, and carbohydrates are believed to play an important part in synthetic processes that occur in normal tissues, as for example the calcification of bone. It must be remembered, furthermore, that these constituents very rarely occur in natural foods in a pure state. For example, lean meat, which is one of the richest common sources of protein, contains a considerable quantity of fat and mineral salts; some varieties of fat are associated with minute amounts of accessory food factors which may be of far greater importance for the nutrition of the consumer than the fats themselves; cereals from the main source of carbohydrates for the human race, but the presence or absence from this class of food of accessory food factors, or of certain toxic properties with which they may be endowed, may determine their nutritive value without relation to the pure carbohydrate they contain. It is therefore clear that the physiological action of any given type of food cannot be predicted from a chemical analysis of its main constituents, and must be studied by feeding experiments carried out on animals or by controlled observations on the human subject.

The Protein Fraction.

Protein from any source, whether animal or vegetable, is built up from a number of simpler chemical bodies known as amino-acids. During life there is a continuous destruction of the protein constituents of the cells which must be replaced by fresh protein constituents supplied in the food. There is every reason to believe that the protoplasm of the various cells belonging to different kinds of tissue must vary very considerably in its chemical make-up—that is to say, in terms of their protein constituents, that the groupings of the amino-acids in the cells of one kind of tissue will be quite different from the groupings in the cells of another tissue. Moreover, for each kind of cell of every species of living animal or plant we may expect a characteristic grouping of these amino-acids. Now, many of these amino-acids cannot be manufactured by animals from other materials and must be supplied ready made in food if the organism is to survive, which it can only do by making good the destruction of material that is continuously proceeding within its body. From the nutritional point of view, therefore, such amino-acids may be termed indispensable, and those proteins which do not contain them will not prove capable of supporting life. This fact was first demonstrated by Hopkins and was one of the earliest pieces of scientific evidence demonstrating the specific qualities of special varieties of foodstuffs. We may say, in general, that proteins of animal origin, with the notable exception of gelatin, are usually complete in the sense of containing all the essential amino-acids, whereas many of the vegetable proteins are deficient in this respect. If this deficiency is absolute the nutritive value of the protein can be restored by adding to the diet a source of the missing amino-acids—a process which is known as supplementing one protein by another, and which is commonly practised by a certain class of vegetarians who add the biologically valuable and complete proteins of milk and eggs to the less complete proteins of their main regimen. If, on the other hand, the deficiency is not absolute but relative—that is to say, if some essential amino-acid is present in a given protein in traces only—it may be possible to maintain the necessary supply to the body by ingesting very large quantities of the protein, a large proportion of which will then be eliminated from the body as useless material.

In any consideration, therefore, of the amount of protein that ought to be supplied to the ordinary individual, it is essential to pay some attention to the quality of the protein that is to be given, and this applies especially to the growing person who is constantly building up protein constituents into new tissue. It must be remembered that the metabolic processes concerned with the protein constituents of foods are so adjusted that a considerable variation in the total intake of protein is possible without affecting the total amount of protein retained within the body. Protein breakdown in the body is measured by the amount of nitrogen eliminated in the excreta, and it is possible for a man neither to gain or lose more nitrogen in his excreta than he takes in his food, whether he eats a large or a small amount of protein. This condition of so-called nitrogen equilibrium depends on many factors, including the nature and quantity of the other constituents of the diet, particularly the amount of carbohydrate eaten, for carbohydrate has a remarkable sparing action as regards loss of nitrogen from the body tissues. It is possible to determine experimentally the minimum amount of protein that will suffice to maintain a man in and the relatively low milk consumption of the population of England must indicate a widespread deficiency of calcium among a large section of the community. Eggs and green vegetables furnish moderate amounts of calcium, and the same is true of the whole cereal grains. In the case of the cereals, however, the amount of calcium in any particular variety gives no indication of its usefulness as an effective source of calcium to the tissues. In fact, the cereals which contain the greatest percentage of calcium may, under certain conditions, actually hinder the effective utilisation of calcium.

Phosphorus is another of the mineral elements which occurs in large amounts in the body. Most natural foods except the sugars contain easily recognisable quantities either in organic combination or as simple inorganic salts; there is no evidence that it is better utilised in the body when supplied in one form than the other. The ratio of the amount of phosphorus in a diet to the amount of calcium may be an important determining factor in the production of experimental rickets. We shall see, however, that this ratio can be varied enormously without the appearance of rickets if attention is paid to other factors in the diet and environment, and it is therefore probably not of very great practical significance in human nutrition. The growing child who receives a liberal daily allowance of milk is not likely to suffer from lack of phosphorus, and the mixed diet of the adult containing meat, fresh vegetables, and dairy produce will supply all the phosphorus he needs.

Iron and iodine are both liable to be deficient in the diet of mankind under certain conditions, symptoms of disease being thereby produced. Under ordinary conditions there is no likelihood of anyone in this country suffering from a deficiency of sodium chloride, but it has been found that men performing hard work under conditions of great heat may lose a great deal in their sweat, and, being very thirsty under these conditions, may drink excessive quantities of liquid so that their tissues cannot maintain their normal concentration of sodium chloride, and they suffer in consequence from the so-called miners' cramps. This condition can be prevented by the addition of sodium chloride to their drinking water. Potassium is usually present in large amounts in vegetables, and an excess of potassium in the food causes the elimination of extra amounts of sodium; this probably explains why herbivorous animals frequently display an intense desire for sodium chloride, travelling miles across country to visit "salt-licks." Sodium and potassium may be of practical importance from another point of view; they are potential alkali producers, while other elements such as chlorine, sulphur, and phosphorus may be regarded as acid-producers. The relative proportions of the two groups of elements in a food are spoken of as the acid-base ratio, and it has been claimed that this ratio may be of practical significance in the prevention and treatment of certain diseased conditions.

These are the main foodstuffs that compose the bulk of our diet, but the most ideal combinations of these substances in a diet will fail to support life without those essential accessory food factors or vitamins which are known to be required to complete the diet.

MEDICINE AND THE LAW.

A Breach of the Cremation Act.

PROSECUTIONS under the Cremation Act are rare; a recent instance was stated to be the first of its kind for over 20 years. Fortunately the facts negatived any suspicion of felonious intent, and it is reassuring to find that a breach of the Act did not escape detection. Proceedings were taken against a Camden Town firm of undertakers in the following circumstances. A man died in hospital and his relatives arranged for his body to be cremated. The defendant firm of undertakers was employed to carry out the arrangements and a shell was brought to the hospital for use in the cremation of the body. It happened that a child born in the hospital had recently died and that the mother, being in poor health, had left the burial to the hospital authorities. The authorities asked the undertakers to arrange for the burial of the child, and, no other provision having been made in advance, the child's body was placed in the shell which contained the man's body for removal from the hospital. By an oversight, which was not fully explained, the shell was taken to Golders Green Crematorium without the child's body being removed, and the two bodies were cremated. Subsequently the firm of undertakers seems to have discovered its mistake. It was stated that the ashes of the child were buried at St. Pancras. A double irregularity had occurred; the child had been cremated without compliance with the statutory conditions and the registrar was notified that the child had been buried when this was not the fact. The Hendon magistrates before whom the case came felt bound to take a serious view of the offence and imposed a fine of £20 with £5 5*s.* costs. Apart from certain vague prejudices which are slowly disappearing, the main attack which cremation has to meet is the criticism that it may be used to facilitate the concealment of crime. The reply to this criticism is a recital of the strict formalities and certificates which the Cremation Act and Regulations enjoin. If a child's body can nevertheless be cremated without compliance with these requirements, it becomes possible to destroy the evidence of infanticide or concealment of birth. Even where there is no suggestion of such a sinister purpose, an irregularity cannot be lightly passed over.

The Un-named Medicine Bottle: A Chemist at Fault.

Is a chemist obliged to write on a bottle of medicine, or on the wrapper which contains it, the name of the patient? Clearly, if he does not do so he omits a reasonable precaution and makes it easier for a jury to find that he has been negligent in the event of bottles being sent to the wrong patient. The point has arisen in the discussion of a complaint against a chemist at a meeting of the West Sussex Insurance Committee. The Pharmaceutical Service Subcommittee reported that a widow, an insured person, handed the chemist a prescription and received a bottle of medicine on which her name was written. Subsequently another bottle was obtained which, on being opened, indicated no name. The widow, afraid that she might be taking medicine not intended for her, sent the bottle back by the hand of her daughter. When it came back again it was found still to lack a name, and the daughter complained of the chemist's rude manner. It was said that he remarked, "We don't often put it on for panel patients." In the course of further evidence it appeared that the patient eventually sent the medicine to the prescribing doctor as she still had misgivings; he tasted it and reassured her. The Subcommittee reported its conclusion that the dispensing of the mixture was not complete till the chemist put the patient's name on the container. They declared that the regulations had been broken and they further found the chemist at fault for his attitude to the patient and to themselves. They recommended that he be censured and that the Minister be asked to withhold the sum of £1 from monies payable to the Committee for medical benefit, a like sum to be withheld from the remuneration payable to the respondent. Some members of the Committee thought this too lenient, one medical practitioner remarking that, if a doctor was at fault, the Ministry took severe measures. After discussion the Subcommittee's report and recommendation were adopted. The duty to write the patient's name on a medicine bottle would seem to be one which might well be expressly insisted upon in the regulations.

BRITISH CONGRESS OF OBSTETRICS AND GYNÆCOLOGY.

THE DUBLIN MEETING.

THIS Congress was held at Dublin from April 24th to 26th under the presidency of Dr. GIBBON FITZGIBBON. On the first day a discussion on the

MANAGEMENT OF CASES OF PELVIC DISPROPORTION

was opened with a paper on Diagnosis by Prof. MUNRO KERR (Glasgow). He pointed out that it was very difficult by any method to arrive at exact measurements of the pelvic inlet, whereas deformities of the outlet could be exactly determined. The selection of treatment for deformity of the pelvis at the inlet depended on exact estimation of the relative size of the head to the pelvis, but for the outlet treatment should be based on exact measurement of the outlet. It was important to recognise minor deformities, since failure to do so often resulted in unsuitable treatment; indeed, he believed that the largest proportion of disasters occurred in this group. The practical question was: Will the head pass? Among the factors which influenced spontaneous delivery were: (*a*) previous obstetric history, (*b*) irregularity in the pelvic brim, (*c*) size of the fœtal head, (*d*) degree of ossification, (*e*) variety of biparietal obliquity, and (*f*) strength of uterine contractions.

Prof. FLETCHER SHAW (Manchester) read a paper on the Immediate Results to Mother and Child of Labour with Contracted Pelvis. One of the most difficult tasks confronting an obstetrician, he said, was to decide what method of delivery to recommend to a woman with a moderately contracted pelvis. It was impossible to lay down hard-and-fast rules; nothing but experience and careful observation would allow of a correct decision. Analysing a series of 290 cases of contracted pelvis delivered in St. Mary's Hospitals, Manchester, in a period of nine months, he laid stress on the fact that among the 242 cases which were admitted from the antenatal department the maternal mortality was nil, the fœtal mortality being 5·7 per cent. The other 48 had been admitted as emergencies, and in these the maternal mortality was 10·4 and the fœtal mortality 56·2 per cent. Better proof of the importance of antenatal examination and subsequent treatment by experts could hardly be adduced. Prof. Shaw went on to describe the methods of delivery in detail, emphasising the importance of a trial labour in an institution under expert supervision. A history of previous stillbirths, he said, inclined him to advise Cæsarean section. This operation at term was preferable to induction before the thirty-sixth week, but he considered that medicinal induction after the thirty-eighth week could do no harm to the child and many cases so treated terminated naturally, which otherwise would have required Cæsarean section. He believed that none of the staff of St. Mary's Hospitals had found any marked advantage from section through the lower uterine segment. In his opinion one of the greatest blots upon modern obstetrical practice was the fact that the increased number of Cæsarean sections had not diminished the number of craniotomies. In concluding, Prof. Shaw emphasised the importance of antenatal supervision carried out by a skilled obstetrician who would attend the patient in her confinement and be responsible for the delivery.

Dr. JAMES YOUNG (Edinburgh) read a paper on the Factors Underlying Maternal Mortality in the Operative Treatment of Obstructed Labour. There was considerable variation, he said, in the published mortality figures of different hospitals in respect of the operative treatment of both clean and emergency cases of pelvic disproportion. He quoted figures from the reports of nine well-known hospitals totalling 1043 Cæsarean sections with a mortality of 3·6 per cent. However, on regrouping certain hospitals the maternal death-rate was shown to vary from 0·7 per cent. to 4·3 per cent. for similar cases. There was evidence that these variations were determined not so much by the type of operation selected and by the operative technique employed as by the success attending the efforts to prevent, on the one hand, contagion of the clean by the emergency case, and on the other hand, contagion transmitted from one emergency case to another. In general this risk of contagion sprang from the inadequacy of the machinery of segregation and this in turn might be dependent upon the difficulty of organising a satisfactory system because of the architectural unsuitability of the buildings. He outlined the general principles followed by the Edinburgh school for the treatment of labour with obstruction due to disproportion.

Dr. J. D. BARRIS (London) gave a contribution on the Results of Disproportion as Treated by Induction. Beginning with an outline of the history and origin of induction he showed how with the increasing safety of the Cæsarean operation it was encroaching more and more upon the time-honoured method of induction. The most difficult problem, he thought, was that of correctly estimating the time at which to induce. The best test of disproportion was the amount of moulding of the fœtal head, but this could only be ascertained after labour was completed. Before labour the sole known factor was the disproportion; it was only during labour that factors previously unknown came into play, such as the moulding and degree of flexion of the fœtal head and the character of the second stage. A floating head even in a primigravida in the later weeks of pregnancy did not of itself indicate disproportion, although it called for investigation. Dr. Barris thought that induction for disproportion had stood the test of time. It was easy to carry out, the labour was usually uncomplicated, it had a remarkably low maternal mortality, it avoided the risk of a difficult labour or Cæsarean section, and the fœtal mortality was not unduly high in suitable cases. Its use, however, should be limited to cases of moderate or slight disproportion after the thirty-sixth week, in which the vertex was presenting. Having regard to our social conditions it remained the best method for such cases.

Dr. BETHEL SOLOMONS (Dublin) read a joint paper with Dr. WENTWORTH TAYLOR (Dublin) on the Diagnosis of Disproportion, Antenatal and Intranatal, with a View to Treatment. It dealt with the material over a period of two years at the Rotunda Hospital, and 204 cases were considered. Among the questions discussed were: Does difficult labour depend on small external measurements? Is the outlet measurement of value? Should the Skutsch pelvimeter be used, and will X ray pelvimetry replace this method? A modification of the external Müller procedure was suggested and illustrated. The Kerr-Müller procedure must be carried out as a routine, and treatment would largely depend on the result of this examination, successful results being only obtainable after experience. In trial labour the details of making a rectal examination were important. The fact that a woman had been delivered of one or two infants normally did not exclude possible difficulty in subsequent confinements. Disproportion might be caused by factors other than the relation of the head to the pelvis; incoördinate uterine action was a typical example. Examples of this abnormality were given and the question was discussed. At the conclusion of the paper a summary of the varieties of contracted pelvis encountered in the investigation was given.

A paper by Prof. R. W. JOHNSTONE (Edinburgh) was devoted to Induction of Premature Labour in Disproportion. He did not agree with those who said that the fœtal head did not grow appreciably in the last four weeks of pregnancy, and pointed out that ossification of the bones of the vault of the skull went on rapidly during this period, the head becoming progressively less malleable. During the five years 1923–27 premature labour was induced on account of pelvic contraction in the Royal Maternity Hospital, Edinburgh, in 104 cases; a follow-up of these showed a combined fœtal and neonatal mortality of 6·7 per cent. Out of 72 babies traced a year after delivery 94·4 per cent. were alive, which compared favourably with the 90·5 per cent. who might be expected to be alive at the end of the first year according to the figures of the Registrar-General for Scotland. The speaker also quoted favourable figures for the second and third years of life. His figures did not bear out the statement that the earlier the induction the greater the fœtal mortality. In conclusion, he compared Cæsarean section at term with premature induction of labour, pointing out that with induction there was no maternal mortality and no uterine scar; the puerperal period was normal, and the fertility of the women, in his opinion, was better than after Cæsarean sections. He thought that induction was suitable for those cases of disproportion where there was just an element of doubt whether a full-sized child would pass through the pelvis (especially in a primipara), for the information so gained would be of great value in subsequent labours. Secondly, it seemed to be indicated for a woman who, in a previous labour, had been delivered naturally of a stillborn child of average or over average size, or in whom a test labour on a previous occasion had failed and necessitated a high forceps operation. Cases of slight contraction of the outlet also came within this category of suitability.

Discussion.

Prof. Osborn Polak (New York) said that in America they had to deal chiefly with generally contracted and high assimilation pelves; rachitic, simple, flat and scoliotic pelves were, he said, relatively rare. Induction of premature labour had received a good trial in America and was being abandoned. He thought that in cases of disproportion one thorough examination of the patient should be made under anæsthesia. He advised the use of oxygen in order to avoid asphyxia neonatorum for those patients that had been given morphia. After 25 years' experience of the upper incision and 11 years of the lower segment one for Cæsarean section, he had come to the conclusion that the latter was superior. In suspect cases he allowed the placenta to be extruded by the vagina in order to avoid contaminating the peritoneum.

Mr. Eardley Holland (London) said that it required much experience to know when to interfere in a trial labour, and therefore it was dangerous to adopt this as a general method. Nevertheless in safe hands trial labour was superior to induction. He thought that most of the antenatal work in England was mere eyewash, and laid stress on the necessity for those who would actually be responsible for the deliveries to supervise the antenatal period.

Prof. Ludwig Adler (Vienna) said that most of the confinements in his country were conducted in hospitals or nursing homes, but the methods were similar to those described by Kerr and Polak. He used pituitrin combined with thymus gland extract in order to induce labour.

Dame Louise McIlroy (London) thought that the age of the patient was more important than contraction of the pelvis and referred to work done in order to determine the amount of "give" in the pelvic ligaments. She did not think that radiographic examination helped much in cases of disproportion.

Prof. James Hendry (Glasgow) found that the fœtal heart-rate was valuable in estimating the degree of pressure on the fœtal head. He reviewed 25 cases of major pelvic contractions that had been under his care. He did not agree that a trial labour was justifiable in a multipara who had had vigorous interference in a previous labour, for he had seen cases where the uterus had not stood the strain.—Dr. J. S. Fairbairn (London) believed in premature induction of labour even in a primipara. He thought it preferable to err rather on the side of prematurity.—Dr. T. G. Stevens (London) also deprecated the general adoption of trial labour for disproportion. He advocated premature induction. He thought that the general maternal mortality from Cæsarean sections was probably in the neighbourhood of 10 per cent. as many cases were never reported. He did not think that the placental site was infected before the placenta was extruded, but that the infection subsequently ascended from the vagina. He therefore did not see why the placenta should not be brought out through the abdominal incision. The high forceps operation should never be done; forceps should only be applied when the head could be seen on separation of the labia.

Dr. W. R. MacKenzie (Belfast) did not agree with those who said that X rays were of no use in measuring the pelvis.—Dr. F. H. Lacey (Manchester) referred to a paper he had read in 1918 on 75 cases of induction at the thirty-seventh and thirty-eighth weeks of pregnancy with no maternal mortality and morbidity, and 95 per cent. of the children surviving.—Dr. A. L. Mudaliar said that cases of immature pelvis were not uncommon in India, where many primipara were only 13 to 16 years of age. He did not induce in these cases except just before term; he thought the pelvis stretched considerably. The speaker described his technique for symphysiotomy, which he had carried out successfully in 34 cases during the last 15 years.—Prof. Miles Phillips (Sheffield) hoped that induction would be generally approved by the Congress, and referred to sluggish uterus as an indication for Cæsarean section during a trial labour.—Mr. R. H. Paramore (Rugby) said that pubiotomy was the only resort when the child was alive and the patient had been in labour some considerable time with a good deal of interference.

Many of the speakers emphasised the fact that antenatal clinics should only be conducted by skilled obstetricians who would supervise the deliveries.

The Chairman for the afternoon session, Dr. Haig Ferguson, referred to three points that had arisen from the papers and discussion: (1) Antenatal care was not the be all and end all, and those conducting the antenatal supervision should follow up the cases and be responsible for the conduct of labour. (2) Forceps should be applied only when the head was low down. (3) Nature induced prematurely in nearly all primigravidæ, for the head sank down in the latter weeks of pregnancy. By giving quinine and castor oil with a small dose of pituitrin the head would pass down into the pelvis and stay there.

FIFTH INTERNATIONAL CONGRESS OF MILITARY MEDICINE AND PHARMACY.

(LONDON, MAY 6TH–11TH.)

The International Congress of Military Medicine and Pharmacy, which meets in London for the first time, is being attended by some 750 delegates representing 40 nations.

INAUGURAL MEETING.

The inaugural meeting was opened on Monday afternoon by Sir Laming Worthington-Evans, Secretary of State for War. Before this meeting the Permanent Committee of the Congress held their session and the delegates paid a visit to Westminster Abbey where General Lanne, representing France, and General Rouppert, representing Poland, headed a procession to the tomb of the Unknown Warrior, upon which they laid wreaths bearing the colours of all the countries represented. The opening ceremony in the Great Hall of the British Medical Association House was brilliant with the uniforms of many foreign armies, in contrast with which the Service dress of our army officers appeared dull, although display of naval uniforms did not lack distinction.

Among those present at the opening ceremony were Lieutenant-General Sir Matthew Fell, Director-General Army Medical Services, President of the Congress, Surgeon Vice-Admiral A. Gaskell, Medical Director-General of the Navy, Air Vice-Marshal

D. Munro, Director of R.A.F. Medical Services, Sir Ewen Maclean, President of the British Medical Association, Sir Lisle Webb, Director-General of Medical Services Ministry of Pensions, Surgeon-General H. S. Cummings, Surgeon-General of U.S. Public Health Service, Commander W. Seaman Bainbridge of the U.S. Naval Reserve, Surgeon-General S. Rouppert (Poland), Major-General Riva (Italy), General Lanne (France), Sir Humphry Rolleston, Sir John Rose Bradford, General Sir A. Blenkinsop, and Sir Wilmot Herringham.

Sir Laming Worthington-Evans said that to a Minister of War it was an inspiring thought that in the field of medicine, at any rate, the nations of the world had reached that unity of aim and endeavour that was still sought from afar in the realm of international politics. What was the secret of this success? Was it not that the medical services were all ranged on the same side against the common enemies of mankind, disease and pain?

Sir Matthew Fell also welcomed the delegates in a graceful speech.

Response was made by Médecin-Général Inspecteur Lanne, Director of the Military Medical School at Lyons, who (speaking in French) said that in attending this Congress he and his colleagues were pooling their knowledge of the medical services of the armies of all the countries represented and were thus rendering a great service to humanity. Surgeon-General Rouppert also responded.

On Monday afternoon the delegates were received in the Throne Room of St. James's Palace, being presented by the Secretary for War.

In the evening a dinner was given, at the Hotel Cecil, to the principal official delegates by His Majesty's Government. Sir Laming Worthington-Evans was in the chair, and among the guests were General Lanne (France), Mr. W. C. Bridgeman (First Lord of the Admiralty), General P. Demolder (Belgium), Field-Marshal Sir George Milne, Major-General Umberto Riva (Italy), Vice-Admiral Sir Michael Hodges, General Sir Walter Braithwaite, Major-General F. J. Bauer, Major-General Lord Moynihan, Lieutenant-General Sir Matthew Fell, General Sniker (Lettonia), Air Vice-Marshal David Munro, Sir Herbert Creedy, Surgeon-General H. S. Cumming (United States), Sir Oswyn Murray, General Stanislaw Rouppert (Poland), Surgeon Vice-Admiral Gaskell, Major-General Saccane, General Stefan Hubicki (Poland), Sir John Rose Bradford, F.R.S., Sir Ewen Maclean, Major J. C. Diehl, Major-General Sir George Makins, Surgeon Rear-Admiral J. F. Hall, Sir James Berry, Surgeon-Commander W. S. Bainbridge (United States), and Lieutenant-Colonel Basha. Sir Laming Worthington-Evans, in proposing the health of the guests, said that it was difficult for a layman to keep pace with the advances in medical science. Experience in the war had shown that the risk of death from disease on the Western Front was much less than the risk of death from enemy action, whereas in all former wars the balance of risk was the reverse. General Demolder and General Rouppert responded to the toast.

A SCIENTIFIC SESSION.

On Tuesday morning the chair was taken by Surgeon Vice-Admiral A. GASKELL, and later by Air Vice-Marshal D. MUNRO. A paper on the

Evacuation of Sick and Wounded by Sea

was read by Surgeon-Commander A. V. ELDER. He said that two points were essential: the maximum speed compatible with efficiency, and the maximum comfort and safety. *The administrative and clinical* aspects of the problem were distinct but equally important. No fixed routine could be laid down for water transport, which was subject to local and weather conditions. For general purposes the best hoisting apparatus was a wooden cot tray—a lidless box suspended by wire slings and hooked on to a single-fall winch wire from a derrick in the receiving ship. This took up too much room when ships' boats were used, and then a bridle with wooden *spreader* was useful. Military stretchers were best dealt with by Lieut.-Colonel Faulkner's canvas sling. Surgeon-Commander Elder recommended the use of a standard stretcher for all services. By this means patient and cot would travel together from the "front" to the base hospital ward, each link in the transport chain having its complement of clean empty cots or stretchers to exchange for loaded ones. The ideal method of transfer was by gangway, which was no more serious than removal from ward to ward; it saved time and did not alarm the patient. Hospital ships should be provided with entry ports on both sides of each deck and rubber-tyred two-wheeled stretcher bogies should be supplied to all ships. Clinically it was important to remember to alleviate pain, heat, cold, thirst, and hunger, and the sedative effects of tobacco must be remembered, although it was contra-indicated for gas cases. Pain might be due to tight dressings. Morphia could not be administered by unqualified persons, but more lives had been lost from shock than from morphia, and anodyne tablets should be present in every medical valise. Every unit ought to have ample supplies of lime-juice and water, hot coffee and cocoa in thermos flasks, and blankets and tarpaulins. Purely surgical cases generally had healthy appetites and their dietary scale should be generous. If the Geneva Convention were to have any value or meaning, it was most important to adhere strictly to the regulations governing the Red Cross.

Group Captain H. V. WELLS dealt with

Evacuation by Aeroplane.

This, he said, had been much used overseas and was the normal method in Iraq. Some aeroplanes could carry several cases and a medical orderly, others took one case each and were useful for small landing grounds. *Aircraft for ambulance carriage* must be constructed on the hoop system and avoid cross-bracing wires, but in emergency a special stretcher could be carried on the upper surface of the fuselage of other types of machine. Air evacuation was the *quickest and easiest means*, serious cases could be treated early, wounded could be removed from a besieged force, and hospitals could be centralised, thus economising equipment and staff. The limitations of the method were weather conditions and the necessity of providing landing grounds near the hospitals. A standard stretcher suitable for all services was desirable, but a light metal stretcher had many advantages for air work. In combined operations the responsibility for evacuation should be clearly understood in advance and the line of demarcation of the naval, military, and air responsibility must be defined on the spot. All ambulance aircraft should be under the control of those responsible for the removal of casualties and under Red Cross protection. Identification by day was difficult, but special lights made it easier at night.

MM. P. OUDARD and A. SCHICKELE presented a

Report from France on Evacuation by Water and Air.

Evacuation *by inland waterways*, they stated, was little used at present, but might be more extensively employed with the *improvement in mechanical* towing. It was suitable for seriously wounded persons who had received treatment. Operations would come under the general scheme for the use of waterways by armies. In the early stages of evacuation *by sea from an expeditionary force hospital ships* might take the place of medical formations not yet landed or not in working order; for this purpose the ships should be small, swift, and surgically equipped so that the wounded could be treated en route for their base. *Naval warfare afforded little opportunity* for the use of a hospital ship, except for helping a damaged vessel which had taken refuge in calm waters.

In distant colonial expeditions the hospital ship was needed for medical rather than surgical cases. The hospital ship must be very seaworthy, strongly built, stable, silent, with a minimum of vibration, and an average size of 8000 tons and speed of 15 knots. Three types were necessary—surgical, medical, and combined. Wards should have from 25 to 100 beds with a minimum of 6 cubic metres of air per person, and beds should be isolated and movable. Isolation wards and padded cabins should be provided and all gangways kept clear. The surgical service should be on deck and general services, salvage, signals, and safety devices should be ample. An amphibious seaplane was useful to have on board. The tanker was a particularly convenient construction for a hospital ship. The senior medical officer must be in charge, the captain being responsible only for navigation and crew, and the medical personnel must be accustomed to seafaring. There must be a complete and close connexion between medical services on sea and land, and there ought to be a military as well as a naval medical base at each port. The two bases coöperated, the former selecting the patients to be embarked and having authority up to the quay. Evacuation of wounded by sea raised several problems of international law which would justify a revision of The Hague Convention of 1907.

The *ambulance aeroplane* must henceforth be considered a routine method of evacuation. It gave swift and comfortable transport, especially suitable for serious cases. Its fitting must chiefly be concerned with giving the best facilities for embarking and disembarking and for comfort and safety during transport of stretcher cases. The small carrier was sufficient for urgent cases in peace time or for colonial use and to take wounded from the front to landing grounds in war, but the medium carrier would prove most useful for military operations in general, transporting patients from the landing grounds to the hospitals. The helicopter should give new facilities in the front area, but it did not seem possible for the aeroplane to get beyond the army corps area. The value of the *ambulance seaplane* in naval warfare was very problematical; it would never be as seaworthy as a boat. It would have to be a large amphibious type with twin engines and careened hull. The ambulance aeroplane raised several points of international law which called for solution. In mountain warfare a *rope way* facilitated evacuation; it consisted of one or more cables, fixed at each end and supported between by pylons, with special trucks for stretchers. Safety depended only on the soundness of the cables; an emergency brake system should be devised to avoid the danger of a traction cable breaking.

Colonel A. Vaudremer briefly discussed the papers.

Visit to Aldershot.

On Tuesday afternoon a visit was paid to the Army Establishments at Aldershot, where one-half of the 500 visitors inspected the R.A.M.C. headquarters and the remainder the Institute of Hygiene. At the Institute bakery a demonstration was given of the production of bread on strictly hygienic lines. A staff of 20 can here turn out, with the aid of modern machinery and draw-plate ovens, 48,990 lb. of bread in ten hours. In the slaughter-house of the butchery a squad of six butchers can kill and dress 20 bullocks and 120 sheep in eight hours. In the meat shop a class of ten men, picked from all arms, was being trained to joint and cut up quarters of sheep. The whole of the quarters in which cooking is done have been newly built, and the soldier at Aldershot is well served, both as regards quality and quantity. He has meat twice a day, and his menu is diversified in accordance with the teaching of modern dietetics. Evidence of abstemiousness was seen in the canteen which provides beer but no spirits; the present-day soldier seems to prefer coffee and tea, supplied in the excellent restaurant. Ample facilities for bathing are to be found in the bath-houses, tub and shower baths, which are provided with hot and cold water. Tubs are still preferred to showers by the rank and file. Every kind of field-kitchen was on view. Demonstrations on disinfestation touched on modes for killing flies and purifying water, with addresses (in French) by the officers in charge. The final visit was to the Chief Command. Refreshments were provided on the sports ground, where a magnificent display was given of physical drill and gymnastics. The foreign guests appeared delighted with the afternoon's fare. The day was fine, the scenery was engaging, the roads were good, and the char-a-bancs travelled fast and smoothly.

Receptions at the Royal Colleges.

Sir John Rose Bradford and Lady Bradford received a large gathering at an evening reception held at the Royal College of Physicians of London on Tuesday evening, when a large number of members of the International Congress of Military Medicine and Pharmacy and British guests were given an opportunity of seeing the splendid portraits hanging on the College walls, and of inspecting an interesting collection of books illustrative of naval and military medicine. The librarian of the College, Dr. Arnold Chaplin, discoursed with pleasant learning on the various exhibits. A programme of music was provided by musicians from the band of the Welsh Guards, and the discussion of a generous stand-up supper filled the intervals of the evening. The musical programme was distinctly light and gay, and the party did not break up till a late hour.

Lord and Lady Moynihan received the guests at a brilliant gathering at the Royal College of Surgeons of England on Tuesday evening, when Sir Arthur Keith gave an admirable demonstration with the epidiascope of museum specimens illustrating design in nature. Afterwards the very numerous guests, of whom a large proportion were French and Belgian, distributed themselves over the exhibits set out for their delectation in the spacious galleries. In the War Museum was an army medical collection with apt examples of reconstructive surgery. The conservator's office contained selected specimens from the museum on which learned members of the Council were present to assist interpretation. The Council room contained Hunterian relics, and there were, of course, the portraits by Reynolds, Lawrence, Romney, and Hogarth to satisfy the artistic sense. Refreshments were served in the library, and an admirable programme of music was rendered in the inner hall by the Royal Artillery Band.

PARIS.

(From our own Correspondent.)

Malariotherapy in France.

The treatment of general paralysis by malaria has been widely practised in France since 1923, when it was introduced into this country by Dr. Auguste Marie. Dr. Henri Claude, who is professor for mental diseases in the Faculty of Paris, has had the method tried on a large scale at the St. Anne Asylum and, like many other French authorities, has come to the conclusion that it is the only form of treatment that can claim anything resembling cures of general paralysis—that is to say, remissions of such length that they may be looked on as due to the remedy rather than to natural causes.

In view of these favourable results Prof. Claude, in a paper read before the Academy of Medicine, urges the necessity of creating special centres for malariotherapy. The method is not one to be applied by any one anywhere and in any way. Without precautions it is certain that accidents will happen and that the treatment will be discredited. Among the reasons for setting up special centres is the necessity of having a suitable source of malarial organisms so as to get attacks mild enough to be harmless to the patient, yet of sufficient virulence to give him the necessary febrile reactions. A well-trained biologist seems to be required at these centres, as well as a competent resident physician who can follow the evolution of the induced malaria.

Another advantage of special centres is the gathering together of many patients in a place where there are special services and opportunities for the thorough study of the disease and its treatment. Of course patients could be sent back to their usual medical advisers if social conditions permitted. Prof. Claude believes that the centres should not be in closed asylums but in open-door institutions; for in this way, he thinks, people will come earlier for treatment and thus have more chance of recovery.

Small-pox in Paris.

There is a large public demand for vaccination both at hospitals and in private practice, this demand following naturally from the attitude of French people towards what they regard as a frightful disease, as I said in my recent letter. Three cases of small-pox have been registered in Paris during the past fortnight. One of the patients was an English lady recently arrived from London, who died some days ago; of the two others I have no special news.

Syphilis by Blood Transfusion.

Cases have several times been reported in which syphilis has been given to a patient by blood transfusion; but hitherto it seems that the Wassermann of the donor has always been frankly positive. A case reported by Dr. Dufour, a leading member of the Paris hospitals' staff, to the Société Médicale des Hôpitaux, puts a new aspect on the situation so far as France is concerned, for the donor had a negative reaction. The recipient of his blood nevertheless developed roseola with a positive W.R. six weeks after the transfusion, so the question now arises whether blood can be contagious though its reaction is negative. If this proves to be so, it will not simplify the preliminaries of transfusion.

Speaking about this case Dr. Tzanck reported one of his own which seems to be the first of its kind. A woman who had had several miscarriages previously was exsanguinated by the last of them and treatment by transfusion was adopted. The blood donor was the husband, who had been responsible for procreating the aborted fœtuses, which seemed, on clinical inquiry, to have been really syphilitic ones. Forty days later the wife had a rash with a positive blood reaction, which leads us to admit anew the possibility that a woman can conceive a syphilitic fœtus by a syphilitic man without herself contracting the disease —a view which has been considered very doubtful for many years.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT).

Medical Ethics and the Lay Press.

AT the present moment the Chicago Medical Society finds itself at odds with the local newspapers and in particular with the *Chicago Tribune*, a somewhat influential journal that has not been unfriendly to the medical profession in the past. The immediate occasion of this quarrel is the dropping of a physician from the Chicago Medical Society because of his connexion with the Public Health Institute of that city. The real dispute lies deeper and involves difficult though important issues.

The Public Health Institute was founded some years ago through the interest of public-spirited and influential citizens who were concerned about the city's venereal disease problem. This institution was not to bring any profit to its founders, and presumably has not done so. The physicians working for it have not been recognised by the Medical Society because of the advertising campaign which the Institute has conducted. This advertising, on the one hand, has undoubtedly contributed largely to the success of the institution, and it may perhaps be inferred has therefor been of benefit to the public health in Chicago. It may also be supposed that the advertising has reacted unfavourably upon the private practices of venereologists in the city and that it has bought some goodwill from the owners of Chicago newspapers. It is this latter aspect of the problem that is insisted upon by the American Medical Association which warmly supports the local society. However, the newspapers insist that another problem is involved—namely, the cost of medical care. It is claimed that by using large scale and efficient methods adequate treatment can be given at moderate cost. To do this was certainly one of the objects of the institute, and it appears to have been achieved. It is, of course, not possible to determine without a full investigation to what extent thoroughness of treatment may have been sacrificed to economy of operation. If, however, price-cutting is added to the unfair advantage of advertising it is clear that such a state of things makes private practice in the same field a risky adventure. Moreover it is obvious that if the Public Health Institute were being conducted by the City Health Department instead of by a philanthropic body the effect on private practice would be no less injurious.

This reflection cannot help but arise in connexion with the resignation from the Medical Society, in protest against its action, of Dr. Bundesen, who, until recently replaced by Mayor Thompson, was the City Commissioner of Health and who is also a past-President of the American Public Health Association. However, it must be said that Dr. Bundesen was a personal friend and political associate of the doctor who has been dismissed, and that these facts may have influenced his decision.

Munificent Gift for Child Welfare.

Senator James Couzens announces a gift of $10,000,000 as a trust fund, to be known as the Children's Fund of Michigan. In spite of its name the fund is not to be limited to work in Michigan alone, the powers vested in the trustees enabling them to take research work into any part of the world. Dr. Hugo Freund, who besides being a trustee is also the Senator's personal physician, is reported to have said: "It is too early to state all the lines of activity contemplated. Mental hygiene and child guidance clinics will be encouraged; vocational and educational problems will receive attention; plans for properly supervised group recreation will be assisted; dietetic, hygienic, nutritional, and other subjects bearing upon the health of children will be investigated whenever and wherever the indication for their study arises." The fund, including principal and interest, is to be disbursed in its entirety in the next 20 years. The total amount that will thus be available is estimated at $17,500,000. It is reported that a New York millionaire is also anxious to dispose of $10,000,000, but is unable to find a method that will help people in need, since every method that he has yet heard of is against natural law and in the end hinders more than it helps. In his perplexity he seems to have offered a reward of $1000 to the person who solves his difficulty.

Farm Centres for Addicts.

The last congress has authorised the establishment of two federal farms for the supervision and treatment of narcotic addicts. Only prisoners committed by federal courts will be eligible to the farms, one being for men and the other for women. Besides custody of the prisoners and treatment of their drug habit the farms will serve as centres of research under the direction of prominent specialists. The separation of addicts from other criminals is a change that reformers have for some years been anxious to bring about.

INSTRUCTION IN SMALL-POX.

To the Editor of THE LANCET.

SIR,—The Metropolitan Asylums Board is to be heartily congratulated in having arranged a special course of instruction in the diagnosis and treatment of small-pox. The treatment of small-pox, of course, is a minor matter for most practitioners of medicine, but there is probably no disease in the whole range of medicine where diagnosis is a more vital matter so far at least as the safety of the community is concerned. It is well known amongst all who have had to deal with the control of small-pox how large a part is played in the spread of the disease by errors in diagnosis, and this deficiency is largely accounted for by the fact that so many practitioners have had little, if any, practical instruction in the subject.

Such a course as has now been arranged by the Board, as announced in your issue last week, will be of a great value to those who attend it, but the pity is that attendance on such a course is not made compulsory on all medical students before qualifying. It is a curious anomaly, a survival, no doubt, of a bygone age, that whilst every student must take out a special course of instruction in vaccination, which now plays only a comparatively subsidiary part in the effective control of small-pox, the subject of the diagnosis of small-pox, which is the keystone of modern methods of control, is largely left to look after itself. I am, Sir, yours faithfully,

C. KILLICK MILLARD,
Medical Officer of Health.

Health Office, Grey Friars, Leicester, May 6th, 1929.

*** The Deputy Clerk to the Metropolitan Asylums Board informs us that the holding by the Board of courses of instruction in small-pox is not a new departure. The lack of sufficient clinical material has, however, rendered it impracticable to organise courses for some considerable time past, though it has been possible, from time to time, for parties of medical students attending fever courses at the Board's hospitals, to attend single demonstrations at the small-pox hospitals.—ED. L.

FLOGGING IN SOUTHERN RHODESIA.

To the Editor of THE LANCET.

SIR,—Under the existing Government of Southern Rhodesia, adult natives may, by law, be flogged. The law, in authorising flogging, shelters itself behind medicine, and medicine sanctions the practice. Government medical officers in Southern Rhodesia are controlled by a Medical Director, and all of them come under his decrees. He sanctions flogging. At the gaols there is a book which has to be signed by the Government Medical Officer certifying that the prisoner is physically fit to undergo punishment, the certificate being manifestly designed to protect the flogger as well as the flogged. The term "boys" is, of course, misleading—it means adults from 17 to 70 years of age. A punishment may be described as "cuts with the cane" and this, to the ordinary Englishman with scholastic experience, sounds innocent enough. It is not so. The prisoner is stripped naked and is then fastened with straps to the triangle which stands in the prison yard. The "cuts" are administered with a long, stout cane upon the bare buttocks. The cane wielded with two arms by a muscular person can, and does, inflict cruel punishment. Not only must the Government Medical Officer certify to the fitness of the prisoner, he must also be present at, and witness to, the flogging. This is a degrading and revolting duty for one medical officer to impose upon a colleague, and not calculated to exalt the professional status of the practitioner of medicine.—I am, Sir, yours faithfully,

R. F. RAND, M.D.

Hartley, Southern Rhodesia, April 8th, 1929.

THE MEMBERS OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

To the Editor of THE LANCET.

SIR,—The annual meeting of Fellows and Members will soon take place. The same resolutions will be passed, the same answers given in different form; all of which concerns management, a trifling claim, and a trifling refusal.

This letter is to plead that the College, Fellows and Members should put on a higher plane the demands and refusals. The Council should cease to act as if they were only an examining body to grant surgical diplomas, and cease to resist all claims to professional distinction by their Members; the gift of two Fellowships each year is no stimulus to special work. Members should claim recognition of skill in their profession, and not only of ability to assist in the internal economy of the College.

No examination ever created a genius (I heard the late Prof. Huxley speak on this subject). The College can easily encourage good work, and make it possible for a Member to become a Fellow other than by the method of examination, which comes easy to a class of brain that is not the most useful in the world. A Fellow has knowledge, but he is not always a surgeon, a Member may not have such technical learning, and he may have failed to absorb text-book information, yet many Members are first-class surgeons and diagnosticians. It is here that the College takes up the position "you cannot enter the honours list of our profession unless you go to school again and cram"—a procedure that is often impossible, and waste of time. The body of Fellows should not be a scientific "pocket borough," with a high commercial value attached to their honours examinations.

I am, Sir, yours faithfully,

W. B. COSENS, M.R.C.S.

Oakley-street, Chelsea, S.W., May 1st, 1929.

BLOOD STANDARDS.

To the Editor of THE LANCET.

SIR,—Dr. Goodhart's vigorous defence of the Haldane instrument and of the makers thereof is based on a misconception of my remarks, for which I fear the brevity of my phraseology is somewhat responsible. I did not mean to imply that there was necessarily an error in the standardisation of different specimens of Haldane's apparatus, but that there was a variation in the hæmoglobin value as estimated by different methods and observers. I hasten to assure Dr. Goodhart that when specimens from the same patient are estimated by such an experienced observer as himself, it would not be possible to question the accuracy of his comparative tests on the same apparatus. This, however, is not always what happens. Observers who do not do much blood work are, in my view, hampered by the *tint* of methods where the colour is red. This always contains proportions of blue and yellow. By taking a monochromatic reading through green glass this error is reduced to a considerable extent.

In regard to Haldane's colour-scale I have found the personal error of different observers to vary within rather wide limits. By using Tallquist's scale in the manner I suggested errors in dilution of the blood are also avoided. For these reasons I consider it preferable to Haldane's or other dilution methods for use in general practice or in cases where the blood of the patient cannot always be estimated by the same observer.

I am, Sir, yours faithfully,

A. KNYVETT GORDON.

Bedford-square, W.C., May 3rd, 1929.

Obituary.

HERBERT JONES, L.R.C.S. IREL., D.P.H.

Dr. Herbert Jones, who died on May 1st at the age of 71 years, had spent a life of rare usefulness as medical officer of health for rural Herefordshire, resigning in 1926 when his health failed. His death occurred at Welwyn Heath, Herts, where he was living in retirement.

Herbert Jones was born at Hanley, Staffs, in 1857, was educated privately, and studied medicine at the Middlesex Hospital, from which he qualified L.S.A. in 1886. After a period of residence in America he returned to this country and began to practise at Shipley, Yorks. About this time he took his triple Dublin qualification and the Cambridge Diploma in Public Health, leading up to his first appointment as whole-time medical officer for the borough of Crewe in 1891. From there he went on to the Rhondda Urban District and finally to the Combined Rural Districts of Herefordshire, which included Leominster, Ledbury, Bromyard, Weobley, and Dore. Later on he was appointed to the newly created county medical officership but he soon reverted, at his own wish, to his former charge. His sure grasp of public health problems, combined with a collossal industry, made him master, as few have been, of the intricacies of public health administration in a rural area. On occasion he would be his own ambulance-driver or serve in any capacity where need lay. Part of his time he was medical superintendent of the rural isolation hospital, and his faithful committee work brought him on to the Council of the Society of Medical Officers of Health, of which at length he became President in 1914. This year saw him seconded for war service, and he rose to be Lieut.-Colonel in the R.A.M.C. (T.), and as such commanded the 2nd line Field Ambulance of the Welsh Brigade, and was responsible for recruiting and training a third unit. He then commanded the 326th Field Ambulance on the East Coast and in Ireland until the end of the war. Writing came easily to him, his first publication of note being a Guide to Examination in Sanitary Science; a text-book of School Hygiene ran into several editions. He edited the *Sanitary News* for some years and was for a while acting editor of *Public Health*. Locally there were few medical institutions which were not revivified by his touch. He was largely responsible for resuscitating the Herefordshire Medical Society, of which he was secretary for many years; he was hon. secretary of the Hereford Division of the British Medical Association and its chairman in 1913, and the popular Speaker of a City Parliament which gave his townsmen the opportunity of practising the difficult art of effective public speaking. For a while, too, he was a member of the National Insurance Advisory Committee, a post which he surrendered in deference to local medical feeling. The public health service will not forget his untiring exertions in the pursuit of security of tenure and adequate superannuation for all grades, partially satisfied in the Sanitary Officers Order of 1922.

A colleague, who enjoyed the intimate friendship of Dr. Herbert Jones during the last ten years of his life, writes of him: "He had inherited from a long line of Quaker ancestors a certain reserve which casual acquaintances failed to penetrate. Within the barrier he was one of the most lovable of men, generous-hearted and broad-minded. A keen power of critical observation, combined with an ease of expression and a wide and varied experience of men and affairs, made his conversation at once entertaining and instructive. There was no end to his interests and activities; he was never happier than when championing a feeble cause, or helping a lame dog over a stile. He was one of the busiest and most energetic men in public affairs, but in spite of his multitudinous duties he would undertake a little office for a friend with as much thoroughness and attention to detail as he would expend on the most important professional urgency. His bearing was dignified, his manner to strangers mild and unassuming; to his inferiors he was courteous at all times and in every circumstance. He was completely free from petty jealousy, and never bore a grudge. Although the last few years of his life were passed in suffering and seclusion he endured to the end with a quiet fortitude and patient resignation."

Dr. Jones was a keen Freemason and held the office of Master of the Vaga Lodge, Hereford, of which he was also a Founder. He was a Founder of the Dean Leigh Masters Lodge in the same Province, as well as Senior Warden of the Hereford Provincial Grand Lodge in 1925. His wife, who survives him, was a daughter of Mark Spencer, of Coventry.

HENRY RUTHERFURD, M.B., F.R.F.P.S. GLASG.

We have already recorded the death of Mr. Henry Rutherfurd which occurred at Glasgow on April 14th at the age of 68. The accounts of him which follow bear witness to qualities, both professional and personal, of a kind that can ill be spared.

"Henry Rutherfurd," writes a colleague, "was the son of a Glasgow linen merchant and was educated at the old High School, and in the University of Glasgow, where he graduated M.A. in 1881, and M.B., C.M. with distinction in 1884. He filled house appointments in the Western Infirmary with the late Sir William Gairdner and the late Sir Hector Cameron, and it is probable that the influence of the latter played a large part in moulding his future surgical career. He maintained his great and intimate friendship with Sir Hector Cameron to the end of his chief's life. He visited the continental schools of Jena and Vienna, and returned to Glasgow to join the staff of the late Prof. Coats as demonstrator in pathology. After filling various junior surgical posts he became extra surgeon to the Royal Hospital for Sick Children, and in 1906 was appointed surgeon to the Royal Infirmary of Glasgow, holding that position till 1921, when he became consulting surgeon to the Royal Infirmary, shortly afterwards joining the board of managers as one of the three members of the board appointed by the Royal Faculty of Physicians and Surgeons. He was also surgeon to the Royal Cancer Hospital, Glasgow, where he early recognised the potentialities of radium as a curative agent, and encouraged the younger members of the staff to carry out original research. He was appointed Fellow of the Royal Faculty of Physicians and Surgeons of Glasgow in 1890, and filled various offices, including those of councillor, examiner, and representative on the Conjoint Board.

"He was extremely happy in his work in the Royal Infirmary, devoting far more time than was commonly allotted to such public work. He had an extraordinarily accurate and full knowledge of the science of surgery, and was renowned for his extreme interest in surgical pathology. His contributions to surgical literature were, however, comparatively few. In his earlier surgical career, in 1898, he was one of the editors of three volumes of Glasgow Hospital Reports, to which he contributed two excellent monographs on the Management of Rupture of the Urethra, and Tumour in the Sacro-Coccygeal Region. Other papers were Nephrectomy for Transverse Rupture, Downward Dislocation of the Patella, and Irreducible Intussusception in the Infant.

"Rutherfurd was a man of interesting personality. He was not gifted with fluent speech; indeed, his speech was well known for its staccato jerky style. But it was remarked that when he did speak, as, for example, in meetings of the Royal Faculty, every word could have been taken down *verbatim* and not a single phrase or word would have required correction. He was a man of keen wit, with a kindly but not cynical eye on his fellow men. It was characteristic of his sense of duty and of his sporting quality that he volunteered for foreign service during the war at the age of 56, being attached to a hospital in Salonika with Serbian soldiers as patients. He was a gentleman of the highest sense of honour with no thought of personal advancement behind any of his actions. He had, essentially, a gift for friendship, and there are many of his time in Glasgow who feel sorely grieved by the loss of Harry Rutherfurd."

Another colleague has sent us the following personal note: "To those of us who were privileged to know and work with Mr. Henry Rutherfurd, his death comes as a personal loss, and there must be many of his former students and house surgeons who will recall their time with him in the Royal Infirmary, Glasgow. A man of wide culture, full of historical and classical knowledge, his conversation during a ward visit might begin with the ancient Persian wars and end on the correct interpretation of a sonnet of Keats. It was perhaps this wide general knowledge that was responsible for the clarity of thought and the almost whimsical outlook on people and things, which were typical of him. Well versed in the surgical literature of the day, he had a humorous eye for the gusty theories which enliven or entwine the surgical wayfarer, and his advice was always to trust clinical experience before anything. His ward journals must have been models of what records should be, and his meticulous care in dealing with patients was, at times, the despair of a house surgeon with a golf appointment. Once beneath his reserve one found a simple, kindly gentleman of the old school, with a wide knowledge of men and things, an honesty of thought and directness of speech which expressed itself sometimes forcibly but always fairly, and a very high sense of duty."

PERCY ROBERTS WILDE, M.D. ABERD.

Dr. Percy Wilde, who died at Bath on April 23rd at the age of 72, was the son of Dr. John Wilde, and was educated at the Universities of Aberdeen and Edinburgh. Even before graduating in 1880 he had already won a prize from the Royal College of Surgeons of Edinburgh for an essay on Public Abattoirs, and in the first few years of professional life, when he was assistant to the Professor of Physiology at Aberdeen and ophthalmic assistant at the Royal Infirmary, he was already writing suggestively on a variety of subjects. Rather more than 40 years ago he settled at Bath, devoting much of his time to the study of physical remedies, especially in relation to rheumatism. A colleague writes of him that he was "a man of striking personality, with an original and independent mind. He was largely responsible for the foundation and progress of the Lansdown Hospital, and was thus a pioneer in the establishment of the self-supporting hospital that lives entirely on the fees paid by its patients. He was also the founder and for many years editor of Wright's 'Medical Annual,' and in its earliest days helped to nurse the little book that it was then into the portly volume that has for years been familiar to readers all over the world." Dr. Wilde also wrote a number of books on spa treatment, therapeutics, and rheumatic disorders, on the ætiology and treatment of which he held original views. He leaves a widow, and one son and one daughter by his former wife, who died some years ago. One son was lost in the South African War, another went down in the *Indefatigable* at Jutland, and a third died about a year ago.

ROBERT EDWARD SARE.

MANAGER OF THE LANCET.

THOSE responsible for the production and publication of THE LANCET have sustained a sad blow by the death of the Manager, Robert Edward Sare, after a severe and painful illness of some three months' duration.

Robert Sare was born on July 5th, 1878, at Bradenstoke, Somerset, the son of Mr. Frederick Sare, received his early education at King Edward Grammar School, Bath, and manifested at the close of his school time the desire to follow the medical profession. Eventually, however, he elected to enter the business side of journalism, and was for several years employed by the *Studio* when, by his work in coöperation with the production of some of the well-known pictorial supplements of our contemporary, he greatly contributed to the success of the periodical. In 1904 he became connected with Messrs. Hodder and Stoughton, and three years later was appointed Manager of the Oxford Medical Publications, which was then a joint undertaking of the Oxford University Press and the former firm.

MR. SARE.

In 1920, when the interests of Wakley and Son, Ltd., the then proprietors of THE LANCET, were acquired by Messrs. Hodder and Stoughton, Sare became Manager of THE LANCET, and in that capacity was well known to all supporters of the paper both on the business and on the literary side, while he added greatly to the personal intimacies which he already enjoyed with many members of the medical profession, owing to his connexion with the Oxford Medical Publications. He worked unceasingly in the exacting and sometimes delicate duties which fall upon the shoulders of the business manager of a journal, who has to recognise at every step the claims, sometimes divergent, of the literary and publication departments. Speaking both for the editorial and managerial sides of the paper, those in the office of THE LANCET wish to record the conscientiousness and courtesy which marked his dealings with them, while they feel certain that they are here expressing the sentiments of all the external staff. Similarly, the chairman and directors of the Board of Management of the paper wish to add their public testimony to his enthusiasm, kindness, and loyalty.

Robert Sare was married to Beatrice, daughter of Mr. E. Richens, of Olney, Bucks, by whom he had five children, of whom the eldest son has followed his father's footsteps into the employ of Messrs. Hodder and Stoughton. Apart from his strong domestic interests, Sare was an extremely keen Mason. He had been Worshipful Master of St. Bride's Lodge, was Senior Warden of the Alliance Lodge, and was a great believer in the influence for good that was diffused by Masonic organisation.

After the funeral service at Coulsdon, where he had his home, a cremation service followed at West Norwood.

ST. THOMAS'S BABIES' HOSTEL.—This Dietetic Hospital for Sick Babies and Mothers, at Kennington, S.E., does specialised work in dietetics, for which it is not possible to find accommodation in a general hospital. A large proportion of the cases are referred from the general hospitals and are of a more severe nature than those usually sent from infant welfare centres, and last year's results are stated to have been very satisfactory, 89 sick babies out of 101 having completely recovered. The hostel trains nursery nurses and gives instruction to public health students, and 300 or 400 requests for the small number trained are received every year. The out-patient department is at present an Army hut which it is hoped to displace by a permanent building together with a nurses' home, but at present only £610 is available for the purpose.

Parliamentary Intelligence.

HOUSE OF LORDS.

THURSDAY, MAY 2ND.

THE RECONSTITUTED CREAM BILL.

The Earl of CRANBROOK moved the second reading of the Reconstituted Cream Bill. After a debate in which Lord STRACHIE, Lord BLEDISLOE, and the Marquess of SALISBURY took part, a motion for the rejection of the Bill was negatived, and the Bill was read a second time.

TUESDAY, MAY 7TH.

The House went into Committee on the Reconstituted Cream Bill, the Earl of DONOUGHMORE in the chair.

Lord CLINTON moved an amendment to substitute the word "artificial" before the word cream instead of the word "reconstituted."

The Earl of ONSLOW, speaking for the Ministry of Health, said the Department preferred the word "reconstituted" to the proposed alternative.

After considerable debate, in which general dissatisfaction was expressed with the Bill as drafted,

The Marquess of SALISBURY (Lord Privy Seal) said that the Government would leave the decision to the judgment of the House.

Lord CLINTON'S amendment was carried, and the title of the Bill was accordingly altered to "The Artificial Cream Bill."

The Bill passed through Committee and was reported to the House.

HOUSE OF COMMONS.

WEDNESDAY, MAY 1ST.

MINISTRY OF HEALTH VOTE.

Mr. Chamberlain's Statement.

The House went into Committee on the Civil Service Estimates. Mr. JAMES HOPE, Chairman of Committees, was in the chair.

On a vote of £14,228,664 for the salaries and expenses of the Ministry of Health,

Mr. CHAMBERLAIN (Minister of Health) said that the policy of a reduction in the housing subsidy had been absolutely justified by the results, and had brought about what was most necessary to-day in housing—namely, a reduction in building costs, which would allow houses to be let at lower rents. Referring to the Widows' and Orphans' Pensions section of the work of the Ministry, Mr. Chamberlain said that since the Pensions Act came into force he had made some inquiry to see how far the relief afforded by the new system to old people and to widows was reflected in the reduced number of those who found it necessary to apply to the poor-law authorities. He was pleased to find that no less than 88,560 persons, including dependent children, who were before in receipt of poor-law relief, had been able to free themselves entirely from dependence on the guardians. That was not really the whole measure of the relief that was being made, because they had to add the number of those who would have applied if they had not received the pension. Turning to the other side of health insurance, the feature of last year had been the coming into force of the new Act. The provisions of that Act had proved to be very beneficial. With regard to the administration of the poor-law, he thought that they had now passed the worst period, and during the last year there had been a substantial reduction in the numbers of those who were in receipt of relief on account of unemployment.

Review of Health Services: Treatment of the Insane.

On the last occasion, said Mr. Chamberlain, he did not touch upon the work of the Board of Control, who were responsible for the treatment of insane persons and mental deficients, and he would like to take that opportunity of saying something about it, because it was very important work. It was not work which was very attractive, but it was very valuable in the general interests of the community. As to the magnitude of the problem there were at present about 141,000 insane persons under care in England and Wales, and that number showed a fairly regular increase of about 2000 a year. That might sound at first rather disquieting, but the increase must not be taken necessarily to mean that the number of insane persons in proportion to the population was increasing at that rate. Insanity was a disease which affected adults and not children, and, of course, as the expectation of life continually increased so a larger and larger proportion of the population reached the later ages and became susceptible to this particular form of disease. The recovery figure was less satisfactory. They must distinguish between insanity and mental deficiency. Insanity was a disease from which people might recover; mental deficiency was an arrest of mental development from which there could not possibly be recovery. But it was a little disquieting that the rate of recovery among insane persons seemed always to remain about the same point—namely, about 30 per cent. He thought, however, that they might perhaps assume safely that with the greater knowledge they had to-day medical superintendents were more careful in classifying cases as cases of recovery than they used to be, and that there might be an increase which was not accurately reflected in the figures at their disposal. There was one class of case, however, in which there was a definite improvement in the matter of recovery, and that was the general paralysis of the insane, which was for a long time considered incurable. It was very often fatal. The new treatment of the general paralysis of the insane was to give the patient another disease, and that was malaria. It was a discovery which he believed came from Vienna. It had been found that by introducing malaria a patient suffering from general paralysis of the insane was now in many cases capable of very considerable improvement, and possibly of cure. In going round a mental hospital to-day one might see as part of the equipment a portion of the ward shut off and surrounded by mosquito curtains, with perhaps one or two beds in it. The patient was brought into this place, the infected mosquito was brought down from London, introduced into the mosquito curtains, and after that the matter worked itself out in its own way. He wished they could make further progress in the matter of research. At present local authorities had no power to devote money to research.

Mental Deficiency.

This matter might well arise out of the Report of the Royal Commission which he hoped would form part of the work of another Parliament. As regarded mental deficiency, some misunderstanding seemed to have arisen as to the attitude of the Ministry of Health towards what was known as the Wood Report. That Report was a report of a committee which inquired into various matters connected with mental deficiency. The Committee issued two very long reports. One of them had been published, and he had been frequently asked when he was prepared to publish the part of the Report which dealt with adults. It was a very long and complex Report, and he must have time to consider it. But he had no intention to withhold from local authorities anything which they ought to know which was contained in this Report. Probably the most important part of it to them consisted of the figures of Dr. Lewis's investigation into mental deficiency which had already been published. As to the rest it was having his personal consideration, and he hoped to be able to make a decision before very long.

The serious aspect of the figures was that Dr. Lewis estimated that there were 300,000 mental deficients in this country, which was about double the number estimated by the Royal Commission in 1908. That must give rise to serious anxiety and apprehension among all who cared about the future physical and mental condition of the people of this country. Naturally it had been asked whether it would not be possible to take some steps to prevent the propagation of a class of people who would never take their proper place in society. They were told that in some countries a system of sterilisation was practised, and they were asked why they should not follow that example. Personally he thought that some day there would have to be a proper scientific inquiry into this matter, because undoubtedly up to the present they had not sufficient data to enable them to come to any satisfactory and definite conclusion. But the mental deficients in this country to-day were, broadly speaking, the product of one-tenth of the population—that was to say, that it was only 10 per cent. of the population who were responsible for the production of mental deficients, and out of that one-tenth only one-tenth—or 1 per cent. of the whole—were themselves definitely defective. The others might be indefinitely defective, unrecognisable as such, and, therefore, it must be clear that any process of sterilisation could not possibly deal satisfactorily with the problem. The ideal method of dealing with these people in the light of present knowledge was in colonies, which should consist probably of not less than 1000 persons if they were to be carried on with the greatest efficiency. These colonies must be considered not as places in which mental deficients should be kept for the rest of their lives, but rather as places where they should be as far as possible trained up to a point at which they could be released and allowed to go out on license and under supervision. But, of course, it was not possible to carry out an ideal of that kind at a single step. It was a costly matter to provide one of these colonies; they had to have some regard to the financial limitations of the country, and they would have to proceed slowly, bearing in mind that they could even now do a great deal to mitigate the lot of these unfortunate people, and to render them less dangerous to society and to themselves. He believed that under the Local Government Act, by which a large number of institutions were placed in the hands of the county and county borough authorities, it would be possible to devote some of those institutions to the reception of certain types both of mental deficients and of insane persons, and seeing that the cost of a bed in a mental hospital was about twice that in a mental deficiency colony, perhaps local authorities would make the best bargain for themselves if they allotted some of these institutions to the treatment of insanity.

Miss WILKINSON asked whether the Minister proposed to do anything to make further provision for the treatment of border-line cases which were not yet certified.

Mr. CHAMBERLAIN said that as far as the present administration was concerned that was the case. It was part of the general policy pursued by the Board of Control all over the country at the present time.

The Four State-aided Services.

The four State-aided health services which came under the Ministry of Health were tuberculosis, venereal disease, the welfare of the blind, and maternity and child welfare. Last year, 1928, there was the lowest death-rate on record both for pulmonary and non-pulmonary tuberculosis. He would call particular attention to the non-pulmonary cases, because 80 per cent. of the decline had occurred among children, and whereas the death-rate among these cases in the ten years from 1901 to 1910 was 500 per 1,000,000, last year it came down to 173. That was due to the greater care taken and the greater knowledge which now existed as to the best method of treating these cripples, as they generally were in the case of children. They had also to bear in mind that the condition of those who survived was very much better than it used to be. Many a child was to-day going about with straight limbs who formerly would have been a permanent cripple. Blind persons, too, were better looked after to-day than they ever were before. Most of them had come under the attention of the local authorities, and there were more and better means of making their sad lot tolerable. He would draw attention in particular to the cases of ophthalmia neonatorum, which in the past had given rise to so many cases of permanent blindness. In 1922 there were 8000 patients of this most distressing disease. In 1927, the latest year for which he had figures, the number had fallen to 5000.

Child Welfare.

The maternity and child welfare work had produced the most striking results of all their health services in the last generation. Last year the infant mortality-rate came down from 70 per 1000, as it was in the year before, to 65. In the five years since he had been at the Ministry of Health the figure had declined 10 points from 75 to 65 per 1000. In other words, in 1928, 6500 babies survived who would have died if they had been born under the conditions existing in 1924. They must, however, not only look at the lives saved; they were, so to speak, a barometer of the general rise in the standard of health among young children, and they might be quite certain that for everyone whose life had been saved there were half a dozen others who were stronger and healthier than they would have been. This wonderful fall in the death-rate in a single year was the product of a number of causes, all combining to work in the same direction, but the expenditure in grants showed that there was a steadily expanding service, and they might claim for that service at least a major share in the very satisfactory results. In 1924–25 the total amount spent by way of Exchequer grants on maternity and child welfare services was £814,000. In 1928–29 the sum was £1,072,000, and in the present Estimates the amount set aside for this purpose was £1,163,000.

Maternal Mortality.

Last year when presenting these Estimates he had referred to the fact that the figures of maternal mortality—deaths of mothers in childbirth—had practically not moved for the last 20 years. He said then that he felt the time had come when it was necessary to make some new and vigorous attempt to deal with this very distressing problem. He set up two committees, one to inquire into the whole conditions affecting the practice and profession of midwifery. That committee had nearly completed its labours, and he hoped that in a few weeks he would have its report. The other committee was one which was directed to trying to throw more light upon the causes of these deaths. Even now they were to a large extent ignorant of the causes of this persistent maternal mortality. He set on foot an investigation with the help of the general practitioners of the British Medical Association and the local authorities, with a view to getting a report on every case of maternal death right through the country. That work had been going on. The committee began to function in the latter part of last year, and 311 deaths formed the subject of reports. This year already they had had reports of 448 more cases. It was too soon to be able to say what conclusions they would be able to draw from this evidence, but already the focusing of the evidence upon these cases and the concentration of attention upon the whole subject had begun to show indications from which they believed they could see some of the flaws and weaknesses in their system which would enable them presently to direct their efforts to the weak spots. The general arousing of public interest, the fixing of attention upon this particular set of circumstances, upon the lamentable results to the health and life of the nation which came from this persistent mortality, in itself had meant that greater care had been given to these matters before and after birth, and although he did not prophesy as a rule he said with some confidence that from the mere fact of this attention being given without any special steps having been taken, they would see a large reduction in this figure which had persisted for so many years.

Small-pox.

There had been a good deal of discussion on the question of small-pox within the last few weeks, and some very embarrassing restrictions had been placed upon the entry of British nationals into another country. That had arisen partly owing to the presence of certain cases of virulent small-pox which had come to this country on a ship. He did not think that this state of affairs would have arisen at all had it not been that the attention of other countries had been drawn to the mounting figures of cases of small-pox of a mild character which had been so remarkable a feature of the last few years. In 1927 there were upwards of 14,000 such cases. Last year there were not quite so many. Although the very fact of these cases being mild had tended to prevent anxiety, he felt that so long as a large part of the population were unvaccinated the country was running a risk which might seem to be small to-day, but which, if there was any spread of a really virulent type of the disease, might cause something like a panic.

Cancer and Radium.

The other matter to which he wished to refer was cancer. Unfortunately the number of cases of that disease was still on the increase in this country, nor had they been able so far, in spite of much research, to say that they had got down to the real cause of cancer or of the agencies which encouraged its development in the human body. What they could say was that after many experiments and some mistakes they had obtained a fairly practical working knowledge of the method of treatment which had been singularly successful, and had, in fact, quite superseded the older methods of surgery—he meant treatment by radium in one form or another. So established was the practice now of the treatment of cancer in many cases by radium that the demands for that substance had become pressing and urgent. It was a substance only found in workable quantities in very few spots in the world, and owing to its powerful character it required most careful handling in its preparation. It was, therefore, a very costly substance, but a subcommittee appointed by the Committee of Civil Research examined into this matter, and informed the Government that 20 grammes of radium were all that could be properly and efficiently used at this moment. Twenty grammes could be obtained at a cost of £200,000, and in the opinion of the subcommittee it was desirable that the Government should offer pound for pound for any sums raised for this purpose by the public. The Government felt that they must at once accept that recommendation, and they undertook to find their share of the necessary money. It was very satisfactory that as a result of appeals which had been made in the Press a very large share of the sum required was already forthcoming. Many generous donors had come forward, and he believed that this was an appeal which was likely to have the sympathy of many people, for who knew which of them might not presently require the very treatment made available by this substance, and which of them, if that were so, would not be prepared to find any sum within his means to escape the anguish, the torture, and possibly death which might follow? It was a great satisfaction to him at the end of this period of his office to find that something had been done to bring relief to many sufferers in the future from this most terrible and terrifying of diseases. He was confident that in a few days they would find that the necessary money had been secured, and that they would be able to proceed to the use of this most beneficent discovery.

Criticisms of Ministerial Policy.

Mr. A. GREENWOOD moved the reduction of the vote by £100. He said that with most of what Mr. Chamberlain had said the Committee would be in general sympathy, but the opposition contended that the country was still faced with a serious housing problem, and the Government had hindered the building of new houses by their policy of a reduced subsidy.

Mr. HOPKIN MORRIS said that he had been hoping that Mr. Chamberlain would give an assurance that the Report of the Wood Committee on Mental Deficiency would now be issued. Why should he appoint a Committee of such distinction and spend public money unless the results of its investigations were to be placed before the country?

A Medical View.

Dr. VERNON DAVIES said that while bearing in mind all that had been done during the past four and a half years in connexion with the health services, and particularly the marked progress in housing, pensions, and national insurance, he was appalled by the amount of work which still remained to be done. It could not be denied that there was a certain amount of apprehension or anxiety as to the non-publication of the adult part of the Wood Report on Mental Deficiency. Although he was convinced that the Minister must have good reasons for his action in this matter, he hoped that he would give the subject his immediate attention and remove unnecessary apprehension. As regarded insanity, it was important to bear in mind that there was a large number of people on the border-line who by proper treatment in mental hospitals could be prevented from going over the line, or could be brought back to normal. That was one of the urgent and vital tasks of the Ministry of Health. The main essential was that they might have a class of patient who could be treated mentally without certification. For years in this country there had been a feeling that any poor individual who suffered mentally was suffering from an affliction inherited from the parents, or that the affliction was from God. If a patient suffered from the heart, chest, or lungs he was regarded as suffering from one of the ordinary afflictions of human life, and there was no discredit attached to it. Why should people try to attach discredit to a poor person who happened to be suffering from mental illness which might be temporary or permanent? Until the Ministry of Health took their courage in both hands and dealt with the Report of the Royal Commission on Lunacy, and brought in legislation for that purpose, this awful feeling towards people suffering from mental affliction would continue. A great work lay before them in that respect. Another important question was that of small-pox. This country, the home of Jenner, the country which first discovered the principle of vaccination and dealt with small-pox, was held up to the ridicule and horror of the world. A neighbourly and friendly country like France, acting in a moment of panic or irresponsibility, issued a very drastic Order against this country in regard to small-pox. At the other end of the world Brazil was taking the same action, and objecting to the importation of people from Great Britain unless they had been vaccinated. He thought that he had read in a publication of the International Labour Office of the Health Commission that this country was the worst vaccinated country in the world. The Minister had powers to enforce the administration of the law. The Rolleston Committee suggested various alterations in regard to vaccination, and he hoped that the Minister of Health would take this matter in hand and see that there was really efficient administration so as to get rid of the curse of small-pox. As regarded the question of cancer, he would draw the attention of the Committee and of the country to the fact that although in radium they had a substance which had proved, and was proving, of enormous value in the treatment of certain forms of cancer, it must not be forgotten that they were dealing with an extremely dangerous element, which ought only to be handled by experts. In the hands of people who did not know how to use it, it was likely to do more harm than good. The essential thing, having obtained radium, was to see that it was used only by people who thoroughly understood it; by medical men who were thoroughly expert in its use. What he was afraid of in this country was not that they would not get a sufficiency of radium, but that for some time they would not have a sufficient number of experts to deal with it.

The Minister of Health took a great interest in the question of maternal health and maternal mortality, and they appreciated the fact that these committees had been set up. They had great hopes that they would lead to a diminution in the maternal death-rate, but he was convinced that the secret of the matter was efficient midwives, properly trained, and, above all, that babies should be born in satisfactory surroundings. It was extremely difficult to say that there was no risk to a mother or baby born in a slum area, but there was a possibility that there was a certain amount, or had been a certain amount, of carelessness. The Minister of Health had said that the fact that he had made inquiries from medical men in the country as to the causes of death had already led to an improvement. That could only be the result of a little extra care taken by the doctor or nurse or the attendants, and a little more cleanliness. If that extra care and attention was going to add to the number of lives saved that alone would more than justify the right hon. gentleman for the work he had done. Very little had been said by Mr. Chamberlain about tuberculosis. Unfortunately they had not had the report for last year. This was a subject in which he (Dr. Davies) took the greatest possible interest, and he would like to know whether there had been any improvement in the compulsory notification of phthisis? Were they getting better results? Was the dispensary system functioning properly? Were they coöperating with the medical men, the sanatoria, and the hospitals? Were they all working as one efficient unit? Would the right hon. gentleman take care to see that under the Local Government Act the tuberculosis system was worked as a complete unit? If it was necessary to have a full-time medical officer for health services, it was ten times more important to have a full-time tuberculosis officer. The one essential thing in tuberculosis was early diagnosis, and that was a matter for the expert. They could not expect the ordinary general medical practitioner, who had not the latest means at his disposal such as X rays, to diagnose the early case. He was pleased to know that there had been an increase in coöperation between the general medical practitioner and the tuberculosis expert. It was no use getting the middle or the final cases; it was the early cases they wanted to get, and they could not get them unless a full-time tuberculosis officer was appointed. Mr. Chamberlain had also said very little about venereal disease. He referred to the diminution in the number of cases of ophthalmia neonatorum, but that was simply an example of the extra care which was being taken. The Minister did not mention how many of the 5000 cases were blind, but he (Dr. Davies) could safely say that with ordinary care and attention there should not be a single case of ophthalmia neonatorum. It was easily preventable, and he hoped the Minister would exercise all the moral and administrative pressure he could in regard to this particular disease. The Minister of Health could look back on a very successful four and a half years' administration. The work of the Ministry of Health during that time had advanced by leaps and bounds. The health of the country had improved, and the social services had advanced. Not the least remarkable result was the great admiration and respect shown to Mr. Chamberlain and to his colleague, Sir Kingsley Wood (the Parliamentary Secretary), by members of the medical profession. Although the Minister was not a medical man he had an uncanny knack of spotting a case, and he had no doubt that if Mr. Chamberlain had been fortunate enough to be a member of the medical profession, he would have risen to great heights. Turning to the vote itself, Dr. Davies said he noticed that under the heading, "Medical Staff (including Government Lymph Establishment)," there were 40 medical officers, two of whom were in receipt of pensions of £400 and £160 respectively per annum from Indian funds; one of a pension from Nigeria and Gold Coast funds to bring his emoluments up to a total of £1305; and two of Army retired pay of £365 and £510 per annum respectively. Were there no medical men in this country fit for these offices without taking retired officers from the Indian Medical Service? It was very essential, particularly in the National Health Insurance service, that a man who had a chance of working up from a general practitioner to a higher administrative office should not be pushed on one side and the job given to another man from another service. There was probably good reason for these appointments, but whatever it was he would be glad to know it.

Care of the Blind.

Captain FRASER said there was not enough general information in regard to the blind community in this country. There were about 48,000 blind persons in this country, of whom about 11,000 were under the age of 40. About 10,000 blind persons were employed, and about 33,000 were described as unemployable. The amount of blindness had decreased, but there was an increase in the number of those who were registered. That was partly due to the fact that the Ministry and the local authorities sought out hitherto unknown cases of blindness and put them on the register in order that they might be cared for. It was also partly due, curiously enough, to the Act of Parliament passed in 1926 for giving blind persons free wireless licences. That had led to an extraordinary increase in the number on the register, and in London alone 900 blind persons had been discovered as an indirect result of the Act. In 1924 the amount spent on the blind from public funds was about £477,000, and in the last year under the same heading £801,000 had been spent, or an increase of about 68 per cent. Considerable progress had been made, and this country could not fairly be charged with being behindhand in the care of the blind, but he hoped that the Minister would think that the time had come to go a little further. In recent years an inquiry had been made by the Ministers' Advisory Committee to find out the number of unemployable blind persons in the country. That inquiry must be nearing regard to the financial limitations of the country, and they would have to proceed slowly, bearing in mind that they could even now do a great deal to mitigate the lot of these unfortunate people, and to render them less dangerous to society and to themselves. He believed that under the Local Government Act, by which a large number of institutions were placed in the hands of the county and county borough authorities, it would be possible to devote some of those institutions to the reception of certain types both of mental deficients and of insane persons, and seeing that the cost of a bed in a mental hospital was about twice that in a mental deficiency colony, perhaps local authorities would make the best bargain for themselves if they allotted some of these institutions to the treatment of insanity.

Miss WILKINSON asked whether the Minister proposed to do anything to make further provision for the treatment of border-line cases which were not yet certified.

Mr. CHAMBERLAIN said that as far as the present administration was concerned that was the case. It was part of the general policy pursued by the Board of Control all over the country at the present time.

The Four State-aided Services.

The four State-aided health services which came under the Ministry of Health were tuberculosis, venereal disease, the welfare of the blind, and maternity and child welfare. Last year, 1928, there was the lowest death-rate on record both for pulmonary and non-pulmonary tuberculosis. He would call particular attention to the non-pulmonary cases, because 80 per cent. of the decline had occurred among children, and whereas the death-rate among these cases in the ten years from 1901 to 1910 was 500 per 1,000,000, last year it came down to 173. That was due to the greater care taken and the greater knowledge which now existed as to the best method of treating these cripples, as they generally were in the case of children. They had also to bear in mind that the condition of those who survived was very much better than it used to be. Many a child was to-day going about with straight limbs who formerly would have been a permanent cripple. Blind persons, too, were better looked after to-day than they ever were before. Most of them had come under the attention of the local authorities, and there were more and better means of making their sad lot tolerable. He would draw attention in particular to the cases of ophthalmia neonatorum, which in the past had given rise to so many cases of permanent blindness. In 1922 there were 8000 patients of this most distressing disease. In 1927, the latest year for which he had figures, the number had fallen to 5000.

Child Welfare.

The maternity and child welfare work had produced the most striking results of all their health services in the last generation. Last year the infant mortality-rate came down from 70 per 1000, as it was in the year before, to 65. In the five years since he had been at the Ministry of Health the figure had declined 10 points from 75 to 65 per 1000. In other words, in 1928, 6560 babies survived who would have died if they had been born under the conditions existing in 1924. They must, however, not only look at the lives saved; they were, so to speak, a barometer of the general rise in the standard of health among young children, and they might be quite certain that for everyone whose life had been saved there were half a dozen others who were stronger and healthier than they would have been. This wonderful fall in the death-rate in a single year was the product of a number of causes, all combining to work in the same direction, but the expenditure in grants showed that there was a steadily expanding service, and they might claim for that service at least a major share in the very satisfactory results. In 1924–25 the total amount spent by way of Exchequer grants on maternity and child welfare services was £814,000. In 1928–29 the sum was £1,072,000, and in the present Estimates the amount set aside for this purpose was £1,163,000.

Maternal Mortality.

Last year when presenting these Estimates he had referred to the fact that the figures of maternal mortality—deaths of mothers in childbirth—had practically not moved for the last 20 years. He said then that he felt the time had come when it was necessary to make some new and vigorous attempt to deal with this very distressing problem. He set up two committees, one to inquire into the whole conditions affecting the practice and profession of midwifery. That committee had nearly completed its labours, and he hoped that in a few weeks he would have its report. The other committee was one which was directed to trying to throw more light upon the causes of these deaths. Even now they were to a large extent ignorant of the causes of this persistent maternal mortality. He set on foot an investigation with the help of the general practitioners of the British Medical Association and the local authorities, with a view to getting a report on every case of maternal death right through the country. That work had been going on. The committee began to function in the latter part of last year, and 311 deaths formed the subject of reports. This year already they had had reports of 448 more cases. It was too soon to be able to say what conclusions they would be able to draw from this evidence, but already the focusing of the evidence upon these cases and the concentration of attention upon the whole subject had begun to show indications from which they believed they could see some of the flaws and weaknesses in their system which would enable them presently to direct their efforts to the weak spots. The general arousing of public interest, the fixing of attention upon this particular set of circumstances, upon the lamentable results to the health and life of the nation which came from this persistent mortality, in itself had meant that greater care had been given to these matters before and after birth, and although he did not prophesy as a rule he said with some confidence that from the mere fact of this attention being given without any special steps having been taken, they would see a large reduction in this figure which had persisted for so many years.

Small-pox.

There had been a good deal of discussion on the question of small-pox within the last few weeks, and some very embarrassing restrictions had been placed upon the entry of British nationals into another country. That had arisen partly owing to the presence of certain cases of virulent small-pox which had come to this country on a ship. He did not think that this state of affairs would have arisen at all had it not been that the attention of other countries had been drawn to the mounting figures of cases of small-pox of a mild character which had been so remarkable a feature of the last few years. In 1927 there were upwards of 14,000 such cases. Last year there were not quite so many. Although the very fact of these cases being mild had tended to prevent anxiety, he felt that so long as a large part of the population were unvaccinated the country was running a risk which might seem to be small to-day, but which, if there was any spread of a really virulent type of the disease, might cause something like a panic.

Cancer and Radium.

The other matter to which he wished to refer was cancer. Unfortunately the number of cases of that disease was still on the increase in this country, nor had they been able so far, in spite of much research, to say that they had got down to the real cause of cancer or of the agencies which encouraged its development in the human body. What they could say was that after many experiments and some mistakes they had obtained a fairly practical working knowledge of the method of treatment which had been singularly successful, and had, in fact, quite superseded the older methods of surgery—he meant treatment by radium in one form or another. So established was the practice now of the treatment of cancer in many cases by radium that the demands for that substance had become pressing and urgent. It was a substance only found in workable quantities in very few spots in the world, and owing to its powerful character it required most careful handling in its preparation. It was, therefore, a very costly substance, but a subcommittee appointed by the Committee of Civil Research examined into this matter, and informed the Government that 20 grammes of radium were all that could be properly and efficiently used at this moment. Twenty grammes could be obtained at a cost of £200,000, and in the opinion of the subcommittee it was desirable that the Government should offer pound for pound for any sums raised for this purpose by the public. The Government felt that they must at once accept that recommendation, and they undertook to find their share of the necessary money. It was very satisfactory that as a result of appeals which had been made in the Press a very large share of the sum required was already forthcoming. Many generous donors had come forward, and he believed that this was an appeal which was likely to have the sympathy of many people, for who knew which of them might not presently require the very treatment made available by this substance, and which of them, if that were so, would not be prepared to find any sum within his means to escape the anguish, the torture, and possibly death which might follow? It was a great satisfaction to him at the end of this period of his office to find that something had been done to bring relief to many sufferers in the future from this most terrible and terrifying of diseases. He was confident that in a few days they would find that the necessary money had been secured, and that they would be able to proceed to the use of this most beneficent discovery.

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St. Thomas's; C. K. Sconce, Liverpool; S. Segalov, St. Bart.'s; F. R. Smith, Birmingham; C. H. Smith, St. Thomas's; G. Steane, Birmingham; J. E. S. Stephens, St. Bart.'s; Muriel H. Steven, King's Coll.; G. D. Stilwell, St. Thomas's; B. L. Taneja, Guy's; G. Taylor, Manchester; T. H. E. Taylor-Jones, King's Coll.; J. O. B. van Langenberg, Ceylon and Middlesex; J. N. Warren, London; J. A. White, St. Mary's; E. M. Wijerama, Ceylon and Univ. Coll.; J. K. Willson-Pepper, St. Thomas's; and D. J. Young, Middlesex.

Midwifery.—R. C. Abel and C. Abraham, Univ. Coll; S. Ahmad, London; Doris Ascough, Manchester; Margaret H. Banks, Royal Free; A. N. Barker, St. Thomas's; E. Bellamy, Guy's; M. J. Bennett-Jones, Liverpool; P. M. F. Bishop, Guy's; D. H. Bolton, St. Thomas's; L. V. O. Brown, Guy's; E. H. Capel, Middlesex; A. Caplan, St. Bart.'s; P. C. Chakravorty, Calcutta; J. L. Clapham, St. Thomas's; F. S. Cliff, Univ. Coll.; F. T. Clive, St. Thomas's; Jane A. Davies, Royal Free; C. M. Dell, St. Thomas's; H. G. Edwards, St. Bart.'s; J. L. Egan, King's Coll.; C. W. Ellison, St. Bart.'s; R. H. El Sawy, St. George's; Cordelia H. England, King's Coll.; H. R. Ferguson, St. George's; L. Findlay, Liverpool; K. S. Fitch, Guy's; Margaret L. Foxwell, Manchester; A. Freitag, Charing Cross; S. Gasson, St. Bart.'s; H. S. H. Gilmer, St. George's; L. H. Griffiths, Middlesex; A. H. Gurney, St. Bart.'s; Elizabeth L. Haden, Univ. Coll.; M. Halperine, London; Mary W. Hamlyn, Royal Free; Y. A. A. Hammouda, Cairo and St. George's; J. T. P. Handy, Univ. Coll.; R. L. H. Harris, St. Bart.'s; Gladys M. Herbert, St. Mary's; P. Y. Hicks, St. Thomas's; Dora M. Hill, Charing Cross; H. L. Hodgkinson, St. Bart.'s; H. B. Hodson, St. Thomas's; J. C. de V. Hutchinson, Guy's; Laura F. Hutton, Charing Cross; K. G. W. James, King's Coll.; W. D. G. James, St. Mary's; T. N. A. Jeffcoate, Liverpool; A. N. Jones, and H. H. Kenshole, Guy's; H. T. Knowles, Leeds; M. Kremer, Middlesex; E. O. Lakey, Univ. Coll.; Grace Law, King's Coll.; J. Libman, Liverpool; F. J. G. Kishman, Univ. Coll.; E. L. Littler, King's Coll.; R. S. C. McDade, St. Thomas's; G. K. McKee, St. Bart.'s; Eileen Massey, King's Coll.; J. W. Matheson, St. Bart.'s; F. Mattar, Charing Cross; E. C. W. Maxwell, St. Thomas's; S. J. Mehta, St. Bart.'s; D. A. Metcalf, London; J. B. S. Morgan, St. Bart.'s; J. E. L. Morris, Liverpool; D. P. F. Malvany, Charing Cross; G. L. Ormerod, St. Thomas's; H. N. Palmer, King's Coll.; E. H. Parkinson, Birmingham; H. J. Partington, Liverpool; C. F. L. Patterson, St. George's; Penelope A. Peach, Royal Free; L. H. Peiris, King's Coll.; J. Petro, St. George's; J. R. F. Popplewell, Guy's; R. B. Pringle, St. Thomas's; C. F. H. Quick, St. Mary's; J. P. Raban, Middlesex; B. Ram and K. M. Robertson, St. Thomas's; Janet M. Rocke, Royal Free; J. F. Sandow, Middlesex; N. D. Sane, London; C. K. Sconce, Liverpool; J. M. Scott, St. Bart.'s; R. L. Sethi, London; G. C. Sheldon, King's Coll.; C. H. Sherwood, Birmingham; W. W. Simkins, St. Mary's; T. Singh, Charing Cross; F. R. Smith, Birmingham; L. A. H. Snowball, King's Coll.; T. M. Spilhaus and R. Stanley, St. Thomas's; Muriel H. Steven, King's Coll.; E. N. Stevens, Guy's; P. H. Taylor, and T. H. E. Taylor-Jones, King's Coll.; K. S. Thompson, London; Eileen A. L. Webb, Royal Free; E. M. Wijerama, Univ. Coll.; T. G. Williams, Middlesex; W. B. Williams, St. Thomas's; and J. P. Woodward, Liverpool.

Pathology ((New Regulations).—F. R. Beetham and A. E. Bowling, Leeds; H. P. Brody, Sheffield; A. Caplan, St. Bart.'s; W. H. C. Croft, Birmingham; V. Dellal and J. S. B. Forde, Manchester; R. E. Holmes, London; M. Kokia, Westminster; E. O. Lakey, Univ. Coll.; E. E. Lewis, St. Mary's; B. R. Medlycott, Guy's; G. A. Y. Parker St. Bart.'s; G. C. Sheldon and L. A. H. Snowball, King's Coll.; F. H. Stevenson, Guy's; and G. Tattersall, Manchester.

ROCKEFELLER MEDICAL FELLOWSHIPS.—The Rockefeller Medical Fellowships for 1929–30 will shortly be awarded by the Medical Research Council, and applications should be lodged with the Council not later than June 1st. These Fellowships are provided from a fund with which the Medical Research Council have been entrusted by the Rockefeller Foundation. They are awarded by the Council, in accordance with the desire of the Foundation, to graduates who have had some training in research work in the primary sciences of medicine or in clinical medicine or surgery and are likely to profit by a period of work at a university or other chosen centre in the United States before taking up positions for higher teaching or research in the British Isles. In special circumstances the Fellowships may be tenable at centres of research not in America. A Fellowship held in America will have the value of not less than £350 a year for a single Fellow, with extra allowance for a married Fellow, payable monthly in advance. Travelling expenses and some other allowances will be paid in addition. Full particulars and forms of application are obtainable from the Secretary, Medical Research Council, 38, Old Queen-street, Westminster, S.W. 1.

THE death is announced on April 30th, at Christchurch, New Zealand, of Dr. Courtney Llewellyn Nedwill, visiting surgeon to Christchurch Hospital. Dr. Nedwill, who received his medical education at Cambridge and St. Bartholomew's Hospital, qualifying in 1902, was at one time Medical Inspector of Railways to the [illegible] Government at Atbara.

UNIVERSITY OF LEEDS.—The degree of doctor of medicine has been conferred on Dr. G. R. Baxter.

BIOCHEMICAL SOCIETY.—This society will meet at the University Museum, Oxford, at 3 P.M. on Saturday, May 11th.

SOCIETY FOR CONSTRUCTIVE BIRTH CONTROL AND RACIAL PROGRESS.—At a general meeting of the Society to be held on Thursday, May 30th, at 8 P.M., in the Essex Hall, Strand, Dr. Mather Thomson will lecture on Sterilisation of the Unfit.

Colonel R. J. Blackham, M.D., who is a member of the City of London Corporation and Clerk to the Worshipful Company of Glaziers, has recently been invested as Grand Sword Bearer of the Grand Lodge of Freemasons of England for the year 1929–30.

MEDICAL PRAYER UNION.—The annual medical missionary breakfast of this Union will be held at 8 A.M. on Wednesday, May 15th, at the Refectory, University College, Gower-street, London, W.C., under the presidency of Dame Mary Scharlieb. An address will be given by Dr. L. E. Sharp, of Ruanda, Uganda. Those wishing to be present should write to the hon. secretary, Dr. Tom Jays, Livingstone College, Leyton, E.10.

GLASGOW UNIVERSITY CLUB, LONDON.—The annual summer dinner of this club is to be at the Trocadero Restaurant, Piccadilly-circus, on Friday, May 31st, at 7.30 P.M. Emeritus Prof. F. O. Bower, President-elect of the British Association, is to preside. Any Glasgow University men who, though not members of the club, desire to attend, are requested to communicate with the Hon. Secretaries, at 62, Harley-house, N.W.1.

LONDON INTER-COLLEGIATE SCHOLARSHIPS BOARD: MEDICAL SCHOLARSHIPS.—This Board announces that an examination for six medical scholarships and exhibitions, and one dental scholarship, of an aggregate total value of £538, will begin on June 25th. They are tenable at University College and University College Hospital Medical School, the London (Royal Free Hospital) School of Medicine for Women, and the London Hospital Medical College. Full particulars and entry forms may be had from the secretary of the Board, Mr. S. C. Ranner, the Medical School, King's College Hospital, Denmark Hill, S.E. 5.

INTERNATIONAL SOCIETY FOR SEXUAL HYGIENE.—The second meeting of the *Internationale Gesellschaft für Sexualforschung* will be held in the House of the British Medical Association, Tavistock-square, London, from August 3rd–9th, 1930. It may be assumed that, as was the case in Berlin, the papers presented for discussion will fall into the following groups: biology; physiology, pathology, and therapeutics; psychology, pedagogy, ethics, æsthetics, religion; demography, statistics, social and racial hygiene: sociology, ethnology, and folk-lore. All the arrangements are in the hands of Prof. F. A. E. Crew, the University, West Mains road, Edinburgh, to whom those interested are asked to write.

DONATIONS AND BEQUESTS.—Among other bequests the late Mr. Obed Charles Hawkes, J.P., of Edgbaston and Birmingham, left £10,000 each to the Birmingham General Hospital, Queen's Hospital, Birmingham, the Birmingham and Midland Hospital for Women, and Birmingham University: £5000 to the Children's Hospital, Birmingham: and £500 each to the Birmingham Maternity Hospital, the Birmingham Cripples' Union and Royal Orthopædic and Spinal Hospital, the Birmingham and Midland Skin and Urinary Hospital, the Birmingham and Midland Eye Hospital, the Birmingham and Midland Ear and Throat Hospital, the Birmingham and Midland Homœopathic Hospital, the Birmingham General Dispensary, the Birmingham Royal Institution for the Blind, and the Institution for the Deaf and Dumb. Subject to other large bequests, the residue of his property will be divided between the Birmingham General Hospital, Queen's Hospital, Birmingham, the Birmingham and Midland Hospital for Women, and the Birmingham University, and the Children's Hospital, Birmingham.—Mr. Illtyd Williams, of Wilderton, Branksome Park, Bournemouth, left £20,000 to the Imperial Cancer Research Fund, but in the event of an established cure for cancer being found, any balance of this fund then remaining is to be applied by the Royal College of Surgeons and the Royal College of Physicians for such further investigation into the diseases of man as they may from time to time determine.

RADIUM AT THE CANCER HOSPITAL.—At the annual meeting last week it was stated that it had become imperatively necessary at once to rebuild the electrical and radio-therapeutic department. There is said to be a pressing need for more radium, of which the hospital holds about 1·25 g. Arrangements have been made for the admission of patients who are able to pay a small fee.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL.—The annual report of this hospital shows that the attendances of out-patients have almost doubled since 1918, and are nearly ten times as many as in 1907. Last year the number of beds was increased from 309 to 368, and a few weeks hence there will be 444. There is a debt of £60,000.

WEST SUSSEX HOSPITAL.—To meet the demand for accommodation for paying patients a portion of the new nurses' home, which is approaching completion, has been temporarily allocated for this purpose. A small maternity ward has also been provided. The West Sussex Associated Hospitals Contributory Fund now covers 26,000 persons.

TRAFFIC ACCIDENTS.—The annual report of the Leicester Royal Infirmary contains some significant figures of the traffic accidents treated during 1928. Injured persons treated numbered 1299, of whom 233 were admitted to the wards. Almost exactly one-half of these cases were the result of accidents to motor vehicles. The total number of persons injured in accidents of various kinds was 10,965, an increase of more than 900 over the preceding year, and the cost of treating them slightly exceeded £10,000.

RAT OFFICER FOR MANCHESTER.—The Manchester Port Sanitary Authority has decided to appoint a rat officer. This will link the practice at Manchester with an international movement against the rat. The International Convention of 1926 decided that the best way to combat the danger of the spread of plague by ship rats was to get some kind of uniformity of practice throughout the world. Under the scheme every ship should either be fumigated or hold an exemption certificate. *The rat officer will have to examine* carefully every ship applying for exemption, and afterwards make a report. Rat-catchers will still see to the catching of the rats, but the rat officer will supervise all the arrangements.

WORK OF MATERNITY HOSPITALS.—The annual report of Queen Charlotte's Hospital shows that 2375 patients were treated last year, "and many hundreds had to be turned away owing to lack of accommodation." The results, as between "booked" and "emergency" cases, were remarkable. Among the 2161 booked cases there were four deaths, a rate of 1·8 per 1000, whereas of the 211 emergency cases 15 died, a rate of 71·0 per 1000. The booked patients are those who receive care and treatment in the antenatal department for many weeks before their confinement. When the new hospital is built at Hammersmith a maternity home will be continued in Marylebone. The new building will have 200 beds, one half of them for paying patients.—The General Lying-in Hospital, in York-road, Lambeth, last year received 1043 in-patients and 1336 out-patients; the patients paid £1583. Under the lease the hospital must be rebuilt by the end of next year; the cost will be £40,000, of which only £18,000 is as yet available.—A new municipal maternity hospital and child welfare centre for the City of Portsmouth was opened a fortnight ago.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, May 14th.—5 P.M., THERAPEUTICS. Annual General Meeting: Election of Officers and Council. Discussion on The Action and Use of Ephedrine. The following have been invited to take part in the Discussion: Mr. Frank Coke, Prof. H. H. Dale, Prof. Francis R. Fraser, Dr. John Freeman, Prof. J. A. Gunn, Dr. J. H. Hannan, Dr. J. H. Thompson, Dr. J. W. Trevan. 8.30 P.M., PSYCHIATRY. Annual General Meeting. Election of Officers and Council. Short Papers: Dr. F. L. Golla: Some Recent Work on the Pathology of Schizophrenia. Dr. W. M. Ford Robertson: Gastro-intestinal Focal Infection in Relation to Oral Sepsis, with Special Reference to Anaerobes occurring in Six Cases of Mental Disorder. (Illustrated.)

WEDNESDAY.—8.15 P.M., TROPICAL DISEASES. Annual General Meeting; Election of Officers and Council. Paper by Prof. Besredka (Paris) on Vaccine Therapy.

THURSDAY.—5 P.M., DERMATOLOGY. (Cases at 4 P.M.) Annual General Meeting: Election of Officers and Council. The Annual Dinner will be held the same evening.

FRIDAY.—8 P.M., OBSTETRICS AND GYNÆCOLOGY. Annual General Meeting: Election of Officers and Council. Short Communication. Dr. Herbert R. Spencer: A Straight Rod Pelvimeter. Short Paper. Mr. Gilbert I. Strachan (Cardiff): Some Contra-indications to Radiotherapy in Carcinoma of the Uterus. Paper: Mr. Victor Bonney: Results of the Surgical Treatment of Carcinoma of the Uterus.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY, May 13th.—8 P.M., Annual General Meeting. 9 P.M., Prof. G. Grey Turner: Cancer of the Colon (Annual Oration). To be followed by a Conversazione.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, Cavendish-square, W.

THURSDAY, May 16th.—8.15 P.M., Meeting preceded by a Demonstration at 7.45 P.M. Dr. Vincent Hodson will read a Paper on Pulmonary Tuberculosis in the Tropics. The Discussion will be opened by Colonel S. Lyle Cummins.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, May 13th, to SATURDAY, May 18th.—MEDICAL SOCIETY Lecture Room, 11, Chandos-street, Cavendish-square, W., M.R.C.P. Course of Instruction. Lectures on Tuesdays and Fridays at 8.30 P.M. Tues., Dr. A. Knyvett Gordon: The Clinical Significance of the Blood Film. Fri., Dr. Bernard Myers: Purpura.—CITY OF LONDON HOSPITAL FOR DISEASES OF THE HEART AND LUNGS, Victoria Park, E. Clinical Demonstration by Dr. J. R. B. Hern, Wed., at 4.30 P.M. Free.—WESTERN OPHTHALMIC HOSPITAL, Adelphi Rooms, 264, Edgware-road, W. Clinical Demonstration by Mr. Cole Marshall (O.P.) on Fri., at 2.30 P.M. Free.—ROYAL FREE HOSPITAL, Gray's Inn-road, W.C. Course of Four Lecture-demonstrations on Antenatal Treatment on four successive Fridays at 5 P.M.—CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C. Course of Clinical Instruction in Laryngology, &c., occupying all day. Last week.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Clinical Instruction every afternoon, lectures twice weekly. Second week.—MAUDSLEY HOSPITAL, Denmark Hill, S.E. Course in Psychological Medicine. Third week.—Further particulars from the Fellowship of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, May 13th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat and Ear Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.

NATIONAL HOSPITAL, Queen-square, Bloomsbury, W.C.

MONDAY, May 13th.—2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Kinnier Wilson: Pain and Paræsthesiæ.

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Critchley: Senile Paraplegia.

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Riddoch: Intracranial Aneurysms.

FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Mr. Elmquist: Demonstration of Re-educative Methods (in Exercise Room).

LONDON HOSPITAL MEDICAL COLLEGE, Mile End, E.

THURSDAY, May 16th.—5.30 P.M., Prof. J. J. R. Macleod: Physiology of Glycogen. (Lecture I.)

FRIDAY.—5.30 P.M., Lecture II.

ST. THOMAS'S HOSPITAL, Albert Embankment, Westminster Bridge, S.E.

THURSDAY, May 16th.—5 P.M., Prof. S. J. Cowell: Dietetics. (Third of six lectures).

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

WEDNESDAY, May 15th.—3.15 P.M. (at the Royal Chest Hospital, City-road), Dr. H. E. Symes-Thompson: Spontaneous Pneumothorax.

ROYAL DENTAL HOSPITAL POST-GRADUATE LECTURES.

WEDNESDAY, May 15th.—6 P.M., Mr. F. St. J. Steadman: Fractures with Special Reference to Treatment.

UNIVERSITY COLLEGE, Gower-street, London.

Thursday, May 16th.—5 p.m., Mr. R. J. Lythgoe: Special Sense Physiology. (Third of six lectures.)

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C

Monday, May 13th.—5 p.m., Dr. J. E. M. Wigley: Napkin Area Eruptions in Infants.

Tuesday.—Dr. H. MacCormac: Treatment of Syphilis.

Thursday.—Dr. H. G. Burford: Pathology Demonstration.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

Tuesday, May 14th.—4.15 p.m., Dr. T. H. Oliver: Uræmia.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

Tuesday, May 14th.—3.30 p.m. (at the Jessop Hospital), Mr. King: Gynæcological Cases.

Friday.—3.30 p.m., Mr. Mouat: Treatment of Septic Conditions of the Hand.

Appointments.

McCowan, P. K., M.D. Edin., M.R.C.P. Lond., D.P.M., has been appointed Medical Superintendent, Cardiff City Mental Hospital, and Lecturer in Mental Diseases, University of Wales.

Rennie, J. K., M.D., Ch.B. Glasg., Honorary Physician to the Royal Infirmary, Bradford.

Turner, Beatrice, F.R.C.S. Edin., M.B., B.S. Lond., Junior Assistant Obstetrician, Elizabeth Garrett Anderson Hospital.

Vacancies.

For further information refer to the advertisement columns.

Accrington, Victoria Hospital.—H.S. £150.
Birmingham, General Hospital.—Two Res. Surg. Regs. Each £100 to £140.
Birmingham, City Babies Hospital.—Res. M.O. At rate of £150.
Blackburn and E. Lancashire Royal Infirmary.—Fourth H.S. At rate of £130.
Blackpool, Victoria Hospital.—H.S. £120.
Bolton Infirmary and Dispensary.—Res. Surg. O. £240. H.S. £150 also Asst. H.S. £100.
Bradford Royal Infirmary.—H.S. £150.
Brighton, New Sussex Hospital for Women, Windlesham-road.—H.S. Also H. P. Each £50.
Brighton, Sussex Maternity and Women's Hospital.—Res. H.S. £130.
Bristol Royal Infirmary.—H.S. At rate of £80.
Burnley, Victoria Hospital.—H.S. At rate of £125.
Bury St. Edmunds, West Suffolk General Hospital.—H.S. £150.
Cambridge, Papworth Village Settlement.—H.P. £100–£200.
Cambridge University.—E. G. Fearnside's Scholarship.
City of London Hospital for Diseases of the Heart, &c., Victoria Park, E.—Physician to Out-patients.
City of London Maternity Hospital, City-road, E.C.—Asst. Res. M.O. At rate of £80.
Colchester, Essex County Hospital.—Asst. H.S. £120.
Derby Guardians Institution and Infirmary.—Second Res. M.O. £250.
Elizabeth Garrett Anderson Hospital, 144, Euston-road, N.W.—H.P., Obstetric Asst. and Three H.S.'s. Each at rate of £50.
Farringdon General Dispensary, Holborn Circus, E.C.—P. to Dis. of Skin Dept. Also S. to Dental Dept.
Gordon Hospital for Rectal Diseases, Vauxhall Bridge-road, S.W.—H.S. £75. Also Hon. Asst. Surgeon.
Gravesend and North Kent Hospital.—Jun. H. S. At rate of £80.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Med. Reg. £100.
Hull Royal Infirmary.—Hon. Phys.
Kensington, Fulham and Chelsea General Hospital, 194, Finborough-road, S.W.—Hon. Radiologist.
Leamington Spa, Warneford General Hospital.—Res. H. P. Also Res. H.S. Each £165.
Leeds Public Dispensary.—Jun. Res. M.O. £150.
Lenham Sanatorium.—Asst. M.O. £400.
Liverpool County Borough.—Jun. Asst. M.O. £600.
Liverpool Eye and Ear Infirmary, Myrtle-street.—H.S. to Ear, Nose and Throat Dept. £100.
Liverpool, Royal Southern Hospital.—Hon. Asst. Physician.
Liverpool, Walton Institution, Rice-lane.—Res. Asst. M.O. £200.
L.C.C. Mental Hospitals Service.—Eighth Asst. M.O. £300.
Manchester, County Mental Hospital, Prestwich.—Locum Tenens. £7 7s. weekly.
Manchester, Monsall Hospital for Infectious Diseases.—Jun. M.O. £350.
Manchester Royal Eye Hospital.—Two Jun. H.S.'s. Each £120.
Margate Royal Sea-Bathing Hospital.—H.S. At rate of £100. Also Asst. Med. Supt. £500.
Middlesex County Council.—Asst. M.O. £600.
Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Hon. Anæsthetist.
Miller General Hospital, Greenwich-road, S.E.—Out-patient Officer. At rate of £150.
Newcastle-upon-Tyne, University of Durham College of Medicine.—Whole-time Assistant. £400.
Norwich, City of.—Asst. M.O., &c. £450.
Nottingham Children's Hospital.—Res. H.S. At rate of £130.
Nottingham General Hospital.—Res. Cas. O. At rate of £200.
Oxford, Radcliffe Infirmary and County Hospital.—Hon. Asst. Physician to Dermatological Department.
Portsmouth Royal Hospital.—Sen. H.S. Also H.S. At rate of £175 and £130 respectively.
Queen's Hospital for Children, Hackney-road, E.—Cas. O. Also H.P. Each at rate of £100.
Rhondda Urban District Council.—Asst. M.O. £600.
Royal College of Surgeons of England.—Election of Professors and Lecturers.
Royal London Ophthalmic Hospital, City-road, E.C.—Pathologist and Curator. £200.
St. Albans, Napsbury Mental Hospital.—Jun. Asst. M.O. £485.
St. Bartholomew's Hospital, E.C.—Physician to Children's Dept.
St. George's-in-the-East Hospital, Raine-street, Old Gravel-lane, E. Res. Asst. M.O. £50.
St. John's Hospital, Lewisham, S.E.—Sen. Res. M.O. £250.
St. Peter's Hospital for Stone, Henrietta-street, Covent Garden, W.C. Clinical Pathologist. £250.
Salford City Infectious Diseases Hospital.—Jun. Asst. Res. M.O. £200.
Sheffield, Winter-street Hospital.—Asst. Tuber. O. £450.
Southport General Infirmary.—Jun. H.S. £100.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S. for Ophthalmic and Aural Departments. £150. Also Asst. H.P. £125.
Stroud General Hospital.—H.S. At rate of £120.
Swansea Hospital.—H.S. £150.
Taunton and Somerset Hospital.—Jun. House M.O. At rate of £100.
University of London.—University Chair of Anatomy. £1000.
University of London, S. Kensington, S.W.—Studentship in Physiology. £100.
Ventnor, Isle of Wight, Royal National Hospital for Consumption, &c.—Asst. Res. M.O. At rate of £300.
Walsall General Hospital.—H.S. Also Jun. H.S. At rate of £125 and £100 respectively.
Weir Hospital, Grove-road, Balham, S.W.—Hon. Consultant to Ear, Nose and Throat Department.
West London Hospital, Hammersmith-road, W.—H.P., H.S., and Aural and Ophth. H.S. Each at rate of £100.
Whipps Cross Hospital, Whipps Cross-road, Leytonstone, E.—Res. Asst. M.O.'s. Each £300.
Will Edmonds Clinical Research Fund.—Fellowship. £500.
Willesden General Hospital, N.W.—Registrars.
Wolverhampton, Royal Hospital.—Cas. O. and Res. Anæsthetist. At rate of £215.
Workmen's Compensation Act.—Two Medical Practitioners, on Medical Board for Silicosis.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Witham (Essex) and Hertford (Herts).

Births, Marriages, and Deaths.

BIRTHS.

Gorsky.—On April 30th, at Overstrand-mansions, Battersea-Park, S.W., the wife of Dr. J. A. Gorsky, of a daughter.

Kessel.—On May 5th, at 11, Antrim Mansions, Hampstead, N.W.3, the wife of Herbert H. Kessel, M.R.C.S., L.R.C.P., of a son.

Salisbury.—On April 29th, at Woodlands, Billing-road, Northampton, the wife of Walter Salisbury, M.D., M.S., F.R.C.S., of a daughter.

Tasker.—On April 28th, the wife of D. G. C. Tasker, M.S., F.R.C.S., of Christchurch-road, Clifton, Bristol, of a son.

DEATHS.

Brodribb.—On April 29th, at Hove, Arthur Hubert Brodribb, M.R.C.S., L.R.C.P., late Hon. Consulting Medical Officer, formerly Hon. Surgeon, Royal Surrey County Hospital, Guildford, aged 57.

Jones.—On May 1st, at Emscote, Welwyn Heath, Herbert Jones, L.R.C.S., D.P.H., late M.O.H., Herefordshire Combined Districts, aged 71.

Sare.—On May 2nd, Robert Edward Sare, of "Cottsmoor," 24, The Avenue, Coulsdon, Surrey, Manager of The Lancet, in his 51st year.

Wanklyn.—On April 30th, suddenly, in his office at the County Hall, London, Dr. William McConnel Wanklyn, Medical Consultant, aged 62.

Weston.—On May 2nd, suddenly, at Lion House, Exmouth, Lieut.-Colonel George Edward Weston, R.A.M.C.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE LANCET: SUBSCRIPTION RATES.

Inland	One Year	£2	2	0
	Six Months	1	1	0
	Three Months	0	10	6
Abroad	One Year	2	10	0
	Six Months	1	5	0
	Three Months	0	12	6

Notes, Comments, and Abstracts.

BACTERIOLOGY OF RHEUMATISM.

Dr. F. E. Graham-Bonnalie read a paper on Some Aspects of Rheumatism at a meeting of the Brighton and Sussex Medico-Chirurgical Society on May 2nd. He pointed out that the successful treatment of most diseases depended upon a just appreciation of the ætiological factors. The greater part of research work tended to show that rheumatism was of bacterial origin, but the biochemical side of the picture should not be ignored. If, for the sake of argument, it was admitted that rheumatism was due to an infecting organism, could one go further and divide it into streptococcal and non-streptococcal? And if such definiteness was possible, why was there not more assurance of success in treatment?

Several possible reasons might be adduced to account for this. Perhaps, for instance, the right organism or the right strain of that organism had not been isolated. Dr. Graham-Bonnalie thought it possible that the streptococcus might alter its serological properties according to its particular domicile for the time being, and therefore he did not believe in using a vaccine prepared from too pure a culture, preferring to combine it with a stock vaccine. A further reason might be that a primary focus had not been eradicated, which focus was more liekly to be connected with the teeth or tonsils than anywhere else. Apparently the bowel was not uncommonly a primary focus, but (like the gall-bladder) was probably more often secondary. Such secondary foci were among the causes of failure, and a factor which had to be taken into account was the sensitiveness of the patient to vaccines, owing to the presence of these foci, or because too large doses were given at the outset, or because a reaction was not always recognised as such. It was not necessary to give large doses to produce improvement. On the contrary, the smaller the dose which produced good results the more efficacious the treatment was likely to be. Sometimes where the patient was sensitive and no localised focal sepsis could be found, improvement continued even if repeated small doses of the same strength had to be employed. An underdose was never wrong; an overdose, especially at the outset, might be disastrous in a case which was at all acute.

In a series of 60 consecutive cases Dr. Graham-Bonnalie had tried to find some relationship between signs and symptoms on the one hand, and the pathological findings on the other, but with no great success. There seemed to be little doubt, he said, that of all the organisms isolated from rheumatic patients, whether from teeth, tonsil, or bowel, the commonest was the *Streptococcus viridans*. In his opinion the problem of dental infection was not so difficult as it seemed, provided all the factors were taken into consideration. He also thought that pyorrhœa probably played little part in the primary production of rheumatism, though it was probably a potent cause of secondary infection of the tonsil, bowel, &c. He had had several cases in which the same organism was isolated from the teeth, tonsil, and bowel, and which had responded to vaccines prepared from the bowel.

COMMITTEE OF MATERNAL HEALTH.

FIVE years ago a Committee of Maternal Health was appointed in the United States to serve "as a clearing-house and centre of information on certain medical aspects of human fertility." It was formed because it was felt by a number of American medical men that the subject of human fertility was of immense social and personal importance and that, for various reasons, it had received insufficient attention from the medical profession. Certain aspects of the subject—eugenical sterilisation of the defective and feeble-minded, for instance—have been expansively treated by lay writers. But for a number of reasons, of which professional timidity is quoted as one, the medical profession has avoided these subjects. The Committee of Maternal Health exists to remedy this omission, and the biennial report for 1927 and 1928 of the Committee is now obtainable.[1] "Timidity" on the part of the medical profession in America is easily comprehensible in view of the existing state of the law. Since 1873 it has been a crime in the eyes of the law to import or transport any publication, article, or information "calculated to lead another to use or apply it for preventing conception or producing abortion, or for any indecent or immoral purpose." In 11 States physicians are expressly forbidden to give advice on contraception. The law is explicit and sweeping, and there are no exceptions either by statute or interpretation. The States are Massachusetts, Pennsylvania, the District of Columbia, Missouri, Nebraska, Kansas, Mississippi, Montana, Arizona, Idaho and Washington. In others the law is less uncompromising and merely contains implications that physicians may not give such advice. In spite of all this legislation, however, birth control is practised throughout the United States as a matter of course by intelligent persons, with or without medical advice, and there are now more birth control clinics there than in this country. The subjects which are specifically studied by the Committee of Maternal Health are control of conception, sterilisation, therapeutic and eugenic, involuntary sterility, and the sex life of socially normal men and women. And the Committee is also trying to secure through the intervention of medical societies an amendment of the Federal laws relating to the physician's attitude to birth control.

THE SEPARATE RAILWAY COMPARTMENT.

A CORRESPONDENT writes: Do the conditions of travel in railway carriages of the non-corridor type give adequate protection to passengers? While there is no need to alarm the nervous, it is reasonable to ask that persons who are shut up with haphazard companions in closed compartments for journeys of considerable length should have the utmost security obtainable. The Minister of Transport, it seems, is not prepared to insist upon the discontinuance of non-corridor carriages. He appears to rely upon the use of the communication cord and upon the provision of compartments reserved for ladies only. Correspondents in the daily press have suggested the provision of some kind of window in the partition between two compartments whereby any molestation of a passenger might be brought to the notice of other passengers next door. Some contrivance of this sort was adopted many years ago after a sensational train outrage, but it lacked popularity, and was perhaps an indifferent aid to safety. Are we to wait for some similar occurrence before making a fresh attempt to solve the problem? The most recent statistics indicate that, out of 893 criminal lunatics who were under detention a year ago, no fewer than 398 had been charged with murder. There may be heavy odds against having a homicidal maniac for a fellow-passenger, but there are other companions hardly more welcome, especially where girls and young women are the travellers concerned. According to the latest figures sexual offences are increasing. Indecent assaults on females were more numerous in 1926 than in 1925, and still more numerous in 1927 than in 1926. More than 2000 persons were proceeded against in 1927 for indecent exposure, a total in excess of the quinquennial average. It is not suggested that any high proportion of these offences was committed in railway carriages, but it is not unreasonable to suppose that the offenders occasionally travelled by train; certainly the existence of closed compartments increases the offender's opportunity. It is not unlikely that the statistics of such offences fall far short of those which actually occur. Many parents and teachers become aware of complaints which are never made the subject of police proceedings. Complaints are made reluctantly and often after so long a delay that identification of the offender is impossible. In any case there is a natural hesitation to increase the discomfort of the victims of these occurrences by subjecting them to the ordeal of the witness-box. The past history of our railway companies hardly suggests that they will move in such a matter in advance of strong public pressure. These are not times when the railways can be expected to make any costly changes: nevertheless, if the railways wish to retain and increase their passenger traffic they must pay attention to a problem which causes not a little misgiving in the public mind.

THE DANGEROUS DRUGS ACTS MEMORANDUM.

X. Y. Z.—There has, we understand, been no general distribution of the Home Office memorandum to medical practitioners, but certain arrangements have been made for its distribution, as occasion offers, through the medical officers of the Ministry of Health, and copies have been circulated to all insurance practitioners by the Department of Health for Scotland. The Home Office will supply a copy to any practitioner who desires it.

M.A., M.B.—Such a door-plate would be an innovation in the Metropolis, but, inasmuch as in many places notice of practice along other special lines is thus indicated our correspondent would not seem to err in any ethical manner if he stated publicly his own line of work as he suggests.

A BRIGHTON CASUALTY DEPARTMENT.—Prince Arthur of Connaught opened the "Bernhard Baron Casualty Department" of the Royal Sussex Hospital last week. In 30 years the number of casualties treated in the hospital has grown from 3000 to 10,000 a year.

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[1] Academy of Medicine Building, Fifth-avenue and 103rd-street, New York City.

An Address

ON

CANCER OF THE COLON.

Being the Annual Oration of the Medical Society of London, delivered on May 13th, 1929,

BY G. GREY TURNER, F.R.C.S. ENG.,

SURGEON TO THE ROYAL INFIRMARY, NEWCASTLE-UPON-TYNE; PROFESSOR OF SURGERY IN THE UNIVERSITY OF DURHAM.

"Let us cherish a sober mind, and take for granted that in our best performances there are latent many errors which in their own time will come to light. . . ."—W. E. GLADSTONE, 1887.

("Locksley Hall" and the Jubilee. Nineteenth Century. No. CXIX.)

MR. PRESIDENT AND FELLOWS,—While deeply conscious of the honour which you have paid me in electing me your orator, I must confess that I am appalled at the task which I have undertaken, and especially do I feel the responsibility when I look down the list of distinguished orators of the past. I can only assume that the invitation is kindly meant as a compliment to the provinces, or I had rather say to the periphery of the provinces, to which I belong. But this does not relieve my anxiety, for I the more feel the responsibility and my utter inability to attain to that high standard which your provincial orators have set.

When John Coakley Lettsom was 45 years of age he wrote as follows of his early training in London: "Having no more money than to carry me through the hospitals I could not attend many lectures, and upon this depended my improvement; for instead of hearing and learning of lectures, I was compelled to learn at the bed of sickness. Here I saw nature and learnt my art without the leading-strings of professors."

Perhaps Lettsom was not unfamiliar with the dictum of the brightest light in the medical firmament of those days, for William Hunter was fond of saying: "Were I to make a man truly great in his profession, I would place him in a large hospital where he might attend the sick and dissect the dead."

In the choice of subject I have followed the example of your distinguished founder and have decided upon a clinical one, in the hope that a personal record of practical work may be of some interest. I like to think that the district from which I hail bears some parental relationship to the development of intestinal surgery, for it is recorded—though I am unable to trace the reference—that in the days of the border raids some skilful leech successfully sutured a case of lacerated bowel, the patient surviving to fight the Scots another day! As I have been working up my material for this occasion, I have often been afflicted by that chilly feeling which comes over one on realising that everything which I have to tell you now has been spoken of before, and that the ground has been tilled and retilled to a high state of cultivation. To me it has been fascinating to see the progress of this branch of surgery during the last 30 years, and to have witnessed the great improvements that have so changed the outlook in my time. It is further interesting to look back only a few years and to find that, in the light of to-day, so much that is comparatively recent has already to be readjusted.

On this occasion I address myself for the most part *to my younger surgical friends, and to the practitioners* who are members of your society. I am reminded of a great politician who said that it had been his life's ambition to do something for the "cottage man." Equally, if I may say so without appearing to patronise, I feel that those of us who have the unique opportunity of working in large hospitals can best help forward the progress of surgery by doing something to encourage and help the younger surgeon, and his trusty henchman, the general *practitioner*.

At this present time, when the action of radium on malignant growths is proving so startling and wonderful, and when its use is being tentatively extended to the internal organs, it seems more than ever important to review the results of our work, so as to be able to state just *what operative surgery has to offer* in the treatment of malignant disease. Further, in view of the other methods of treatment for cancer which are being earnestly tried by so many workers, and the results of which were debated with such heat in this very room, it appears to me more and more important that we should know the natural history of cancer, not only as to its causes and early stages, but as to its end-results. A surgical giant, reared in a school of giants, and himself a teacher of surgeons the world over, made the following pronouncement not quite ten years ago:—

> "Growths in the colon are low in the scale of malignancy; they do not spread widely or rapidly in, or away from, the bowel; their vascular and lymph vascular territories so closely correspond that a free removal of glands can safely be made, wide resection is easy, and subsequent anastomoses are made without difficulty. The primary growth, its extensions in the intestinal wall, and all primary and many secondary glands, can therefore in most cases be removed in one block. These are all facts which entitle us to say that few places in the body affected by carcinoma *are so accessible and safe to curative operations.*"—(*Moynihan.*)

THE RESULTS OF OPERATION.

As an ordinary surgeon, I invite you to review with me the results of my own efforts. The members of my audience are sufficiently familiar with this subject to know that the ideal at which we must aim is the removal of the growth with a sufficiently wide area of healthy tissue, including the path of probable malignant invasion and followed by restoration of the continuity of the canal, or, if that is impossible, the removal must be carried out at the price of a permanent colotomy.

I have now interfered surgically in 241 cases of cancer of the colon. I regret that I am not able to state how many cases I have seen in all, and in how many I have decided to do some operation of one sort or another, but not many cases have been wholly rejected, which is to say, the operability rate has been high. In any event, such a computation as I have mentioned would not be entirely accurate, as only cases in which something surgical was thought feasible would be sent to a surgeon. However, it is interesting to note that, out of the total number of cases, it was possible to carry out a radical operation in 142, —that is, 58·92 per cent.—only a palliative anastomosis or some type of colostomy in 85, or 35·28 per cent., and a mere exploration in 14, or 5·80 per cent., *of the total. Among the 142 cases in which the growth* was removed in the hope, though not always with the expectation, that it would prove a radical cure, there were 27 deaths, a mortality of 19 per cent.

On Dec. 6th, 1920, there was an interesting and important discussion on this subject held in these rooms, when Lord Moynihan made the pronouncement referred to. At that meeting I reviewed my cases up to the end of 1919. In that series there were 58 resections with 15 deaths, a mortality of 25·86 per cent. Since that time I have carried out resection in a further 84, with 12 deaths, a mortality of 14·28 per cent. This happier result is probably due to the lessons learnt at that discussion, and I would indeed be gratified if I felt that anything that I can say would still further improve the figures.

It is a necessary and salutary duty to review the cause of the deaths, and these are set out in the following table.

Among the group of 15 cases due to peritonitis there are several in which this was undoubtedly diffused by operating in the presence of sepsis, such as abscesses in connexion with the growths, or imperfectly drained bowel, or bowel harbouring stercoral ulcers, which in two cases gave way. In some cases there was failure of union of the anastomosis, and in one case it followed the closure of a colotomy, the last step in a three-stage operation. In some others the sepsis may have been introduced.

Causes of Death in 142 Resections.

Peritonitis or other sepsis	15	Heart failure	1
Intestinal obstruction ..	3	Exhaustion	1
Pneumonia	3	Not known	1
Hæmorrhage	1		
Shock	1		27
Diarrhœa	1		

These and the other conditions tabulated are of the kind that account for death after other major surgical undertakings in the abdominal cavity, and I have no desire to attempt to explain them away or to whitewash my failures. A surgeon who looks back must have many regrets, and indeed he is fortunate if he can always avoid that remorse which Robert Burns confessed was so heavy a burden. I am conscious of many errors of judgment—call them mistakes if you will—and this knowledge encourages me to believe that there are good reasons to hope that, without diminution in surgical enterprise, this mortality may be considerably reduced. Unhappily, in their daily work, surgeons are constantly reminded that "ideals are not for attainment but for pursuit," and in this chase I like to think that we might arrive at a mortality of about 5 per cent., which I believe would represent the result of the acme of judgment and perfection of technical skill. But progress is evasive and "knowledge comes while wisdom lingers," or I would not have regretfully to confess that the last two cases of my series have both died, one as the result of a leaking anastomosis, and the other from heart failure because I carried out at one sitting what ought to have been a two-stage operation in a weakly and frightened subject.

This matter of the mortality cannot be viewed alone, for it has a very definite relationship to the question of operability. For my own part I suspect a surgeon of being too timorous who has a low mortality with only a low operability-rate. On the other hand, a surgeon with a high operability-rate and a heightened mortality is certainly endeavouring to do more for his patients, though he may engage in some desperate adventures.

Parts of the Bowel Involved.

—	Cases.	Deaths.	Percentage.	Stages of operation.
Cæcum	22	4	18·18	All in one.
Ascending colon	6	2	33·3	3 in one. 3 in two.
Hepatic flexure	7	0	—	3 in one. 4 in two.
Transverse colon	14	4	28·57	9 in one. 5 in two.
Splenic flexure	15	2	13·3	3 in one. 12 in two.
Descending colon ..	9	3	33·3	4 in one. 5 in two.
Sigmoid	69	12	17·39	26 in one. 43 in two.
Totals	142	27	19	70 in one. 72 in two.

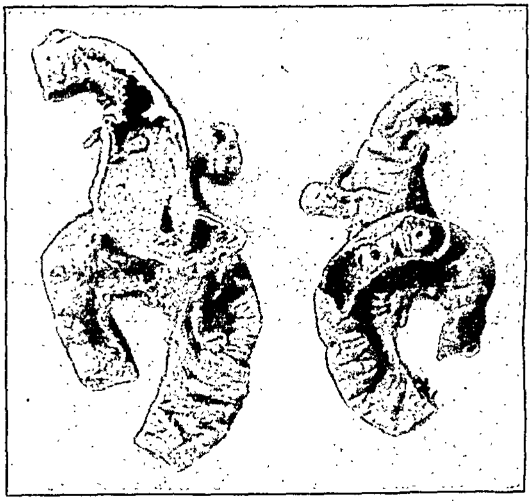
SITE OF GROWTHS.

It is interesting to note that in nearly half the cases the growths were in the sigmoid, and if we add those in the descending colon to the latter, then this region shows a marked preponderance—78 cases to 64 in the remaining parts of the great bowel taken together.

It is often stated that there are very marked differences between growths in the right half as contrasted with the left half of the colon, and that these differences have much bearing on the symptoms, the problems of diagnosis and treatment, the operative mortality, and the after-results. I can only say that I have not found it so marked, though, of course, my series is trivial as compared with the very large numbers dealt with in, for instance, the Mayo Clinic. There is this very clear difference—that the more urgent cases of obstruction, in which bowel drainage is clearly indicated, are far more frequent when the growth is situated from the splenic flexure onwards. In this gross difference a fallacy is concealed, for surgeons are often tempted to underestimate the significance of the lesser degrees of obstruction which do constantly occur with growths situated between the ileo-cæcal valve and the splenic flexure.

The consideration of these points leads to a study of the relationship of obstruction to the mortality of the operation of excision. My cases show that where patients have been subjected to preliminary drainage, the mortality of the subsequent excision has been almost halved.

FIG. 1.



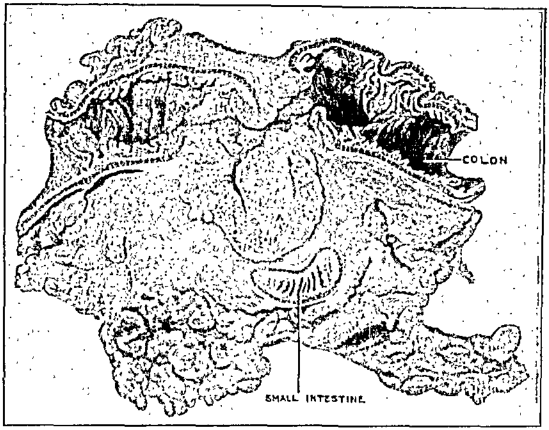
Carcinoma of the colon involving the small intestine and with three natural anastomoses. The uterine appendages were also involved. The patient was 65 years of age and had suffered from recurring colic for four years and bleeding for 12 months. This patient died after removal of the growth and at the post mortem no evidence of dissemination could be found. (Case 4 in table of multiple resections.)

CONDUCT OF THE OPERATION.

Seventy of the cases were operated on in one stage with 18 deaths (25·71 per cent.); whilst 72 were done in two or more stages with 9 deaths (12·5 per cent.). In 62 cases there was a preliminary cæcostomy or colotomy, and in 10 there were preliminary anastomoses. The mortality of the one-stage operations is the more to be regretted because they probably include most of the cases where the local conditions were the more favourable for removal.

Surgeons often deplore the fact that they do not get an opportunity of carrying out operation in cases of cancer of the colon until obstruction has developed, but these figures show that it is probably a matter for congratulation rather than complete regret, and that it is more correct to speak of obstruction as a fortunate accident rather than an unfavourable complication. There are two varieties of obstruction in connexion with big bowel growths; there is the sudden and acute obstruction which may be the first and only symptom that anything is wrong in that particular case. In my opinion this is a most fortunate happening, and reminds me of Kocher's dictum that the patient with the malignant growth at the outlet of the stomach was to be congratulated in that the mechanical obstacle drew so much earlier attention to the presence of the neoplasm and demanded earlier surgical interference. The other, and slower, obstruction, which culminates in an acute attack is rather different, and in this particular class of case the final acute obstruction is more unfavourable, because the bowel has become chronically distended, infected and sodden, *and there may be stercoral* ulcers, and it does not so quickly or readily recover as when the process has developed acutely. Though the patients' symptoms are not so obviously insistent there is more damage from toxæmia and more time is necessary for this to be overcome.

FIG. 2B.



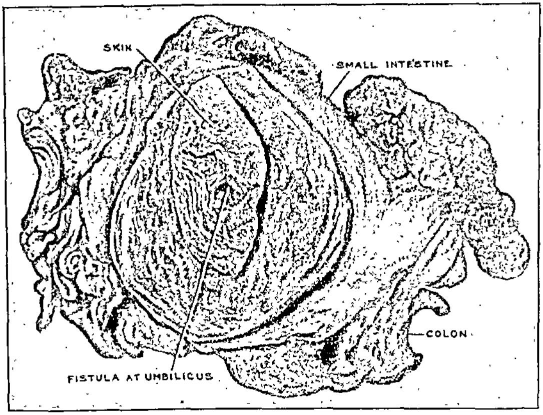
Shows the reverse of previous figure. The colon growth is seen in section. The portion of small intestine was as long as the piece of colon but is buried in the mass removed.

OPERABILITY.

This seems the proper place to deal with the question of operability. One principle has always guided *me in dealing* with intra-abdominal malignant disease—viz., *unless there is some unequivocal evidence of distant dissemination the patient deserves the chance which operation alone offers.* Whatever the future may have in store, in my opinion the time has not yet arrived when the progressive surgeon dare allow himself to be guided by any other rule. Undoubted secondary deposits in the liver, or diffused nodules in the peritoneum, or involvement of the glands in the left posterior triangle, or other distant metastases, are absolute contra-indications to radical operations. Free fluid in the abdomen is always of evil omen and, if associated with the presence of nodules felt in the recto-vesical pouch or elsewhere, means diffusion of the growth, but smaller amounts of fluid, and without evidence of nodules, may result from a slight persistent obstruction and need not debar us from successful interference.

The mere size of a growth, or its fixity, or the involvement of neighbouring structures need not mean that it is necessarily irremovable. In fact, I have long held that the larger growths, if of slow development, are often the more favourable. The size of the growth and the reaction of the surrounding tissues, as shown by the development of adhesions, suggest to me that, in that particular case, the body is capable of a good resistence to the malignant invasion and are really signs of good prognostic omen.

FIG. 2A.



Malignant growth of transverse colon invading an area of the abdominal wall around the umbilicus and with a fistula at the site of the latter. A loop of small intestine was also involved and had to be removed. The continuity of both parts of the bowel was *restored* and the patient was alive and *free from recurrence 9 years* and 4 months afterwards. (Case 8 in list of multiple resections.)

Not many years ago I was accustomed to see most capable surgeons declare growths to be irremovable simply because they were locally fixed and could not *be lifted out of an abdominal* incision. Of course, there is a fixation that is due to direct invasion of the surrounding parts by the growth, and that is undoubtedly more serious, but I can truthfully say that, in the absence of dissemination, the local conditions have seldom proved a bar to successful removal. Whether or not such removal has always been justified by the after-result is a difficult question to answer.

Generally speaking, extension of the growth into the mesentery is much more unfavourable than extension in the opposite direction, and few cases ultimately do well in which such mesenteric extension has occurred.

In dealing with malignant disease in general, the importance of assessing the degree of malignancy of any particular growth while it is yet in situ is one of the greatest desiderata. To the naked eye, regardless of its training, and later to *ordinary* microscopic examination, there are no means of telling which growths will soon recur, and which may be expected to pursue a less rapid course. I make bold to assume that the behaviour of malignant growths may depend as much on the soil—that is to say, on the individual affected—as on the particular growth. But this I can say, that when I have felt that a radical operation could not be done because of the presence of dissemination, or the local extension of the growth, or the presence of glands, and have carried out a short-circuiting or other palliative measure, my patients have speedily gone downhill towards an inevitable fatal issue. It has not been my experience to have patients survive for many years after any of these palliative measures.

Multiple Resections.

No.	Extent.	Stages.	Result.	Remarks.
1	Transverse colon, loop small bowel with abscess.	One	D.	Peritonitis 5th day.
2	Sigmoid with uterus, tubes and pelvic pertoneum.	Two	C.	Permanent colotomy. Died recurrence 3½ yrs. later.
3	Cæcum and ascending colon with 9 feet small intestine and abdominal wall.	One	C.	Died at 12 mths. Apoplexy.
4	Sigmoid with small intestine and left appendages.	One	D.	Peritonitis—anastomosis gave way (Fig. 1).
5	Sigmoid with uterus, ovary and pelvic peritoneum.	One	C.	Permanent colotomy. Died 5 yrs. and 8 mths. later without recurrence.
6	Ascending colon and large mass small intestine.	One	D.	Peritonitis.
7	Sigmoid with left appendages.	Two	C.	Permanent colotomy. Died 14 yrs. and 4 mths. later. No recurrence.
8	Transverse colon, small intestine, abdominal wall.	Two	C.	Alive without recurrence, 9 yrs. and 4 mths. later (Fig. 2).
9	Cæcum, ascending colon and piece of duodenum.	One	C.	Died of recurrence in 3 mths.
10	Sigmoid and piece of bladder.	Two	C.	Permanent colotomy. Alive and well at 8 yrs.
11	Splenic flexure with strip of fundus of stomach and tail of pancreas.	Two	C.	Alive and well 7 yrs. and 10 mths. later.
12	Sigmoid with uterus and appendages.	Two	C.	Died of recurrence at 1 yr. and 7 mths.
13	Sigmoid and loop small intestine.	Two	C.	Alive and well at 4 yrs. and 7 mths. (Fig. 3)
14	Sigmoid with large area abdominal wall.	One	C.	Alive and well at 4 yrs. and 8 mths. (Fig. 6).
15	Sigmoid with left appendages.	Two	C.	Died of recurrence at 1 yr. and 3 mths.
16	Splenic flexure, small intestine, cuff of stomach.	Two	C.	Alive and well at 2 yrs. and 4 mths. (Fig. 4).
17	Sigmoid, small intestine and uterus.	One	C.	Secondary anastomosis. Alive and well at 2 yrs.
18	Splenic flexure and small intestine.	One	C.	Died in a few months; secondaries in liver.
19	Sigmoid with left appendages.	Two	C.	Died of recurrence at 1 yr. and 10 mths.
20	Sigmoid with uterus and appendages.	Two	C.	Secondary anastomosis; early recurrence.
21	Sigmoid with uterus.	Two	D.	Paralytic ileus.
22	Transverse colon with pylorus.	Two	C.	Recent.

Total, 22 cases with 4 deaths = 18·18 per cent.

Much has been said about the low grade of malignancy of bowel growths, but that general statement requires some qualification. While a large proportion of these tumours display this comparative benignity, another large group certainly do not. Among the latter are many where dissemination occurs early and where natural termination occurs in as many months as the other type may take years.

Quite possibly surgeons get a distorted view of this matter, for they are only likely to see the cases which have *remained local for long*, and are not consulted about those where early local or general dissemination has left them under the care of those who recognise that the need for surgical interference never arises.

I have seen many of this type. Some figure among those of my series where exploratory laparotomy only was carried out, and many among the cases subjected to the makeshift operations. Many of those which follow an acute course probably masquerade under the care of the physician because they early develop peritoneal deposits with ascites, or secondary deposits in the liver, either of which overshadow the symptoms of the primary growth. Thus, those which may have been slow in arriving at such a condition in which surgical intervention may be required, *often seem less virulent in their progress*, though it may be that the measures necessary for their removal, or for other surgical treatment by palliative operations, may sometimes be the means of hastening their progress. When the case appears to be of the more indolent type the surgeon may take heart of grace, for it is wonderful for how long they may remain local (Fig. 1).

Deep conviction leads many in our profession to believe that cancer is never a local disease, and that it can never be eradicated by local interference. This attitude may certainly apply "the spur to investigation, and the rein to hope," but it is indeed an unhappy frame of mind for the surgeon. I am accustomed to tell students that in dealing with cancer the surgeon should have faith in its local nature, *such faith as is suggested by Millet's famous* picture, "The Angelus." Without such faith the half-hearted efforts of the timorous rob them and their patients of their just rewards. The best commentary I can make on this question of operability is to refer you to the table of multiple resections.

THE FUNCTIONAL RESTORATION OF THE PATIENT.

Patients have no real knowledge of, and less sympathy with, technical difficulties, and only value the work of the surgeon and the worth of his operations by the perfection of the functional results. We therefore aim at restoring the continuity of the intestinal canal, and often at considerable risk. In this series of 142 bowel excisions, this happy result was brought about in 124, and only in 18 was it necessary to leave a permanent colotomy after successful removal of the growth. In eight cases Paul's method was employed, and I would like to say how much the work of that surgeon has helped in the progress of the surgery of the large bowel. It will always remain as a milestone that will not be forgotten.

So much for the immediate results and the technical success of the measures employed. The following list epitomises the after-history of those cases which survived:—

After-history of 115 Patients who Survived the Operation.

- 32 are either alive or are known to have died without recurrence more than five years after operation.
  - 26 are alive and well more than five years after operation.
  - 6 are dead, but without recurrence more than five years after operation.
- 30 are known to be alive and well without recurrence less than five years after operation.
- 2 died within a year without recurrence.
- 41 are known to have died of recurrence.
- 3 are alive, but with recurrence.
- 7 have not been traced.

It would ill become me to endeavour to bias you in favour of the results which I am able to present, but in order that they may be the more encouraging, and in common fairness, I would point out that there has been no exclusive selection of cases, for I have always believed that in the gastro-intestinal canal, excision of a malignant growth is the best method of palliation. Many unfavourable cases have been tackled with this in view, but they have not been differentiated in making the analysis of the results. Had I only included the cases in which there seemed to be a good prospect of ultimate success, the record would have been a better one, though the numbers must have been considerably smaller.

Details of 26 Patients Alive and Well More than Five Years after Operation.

2	after	15 yrs.	2	after	9 yrs.
1	,,	14 yrs. 4 mths.	2	,,	8 yrs. 8 mths.
3	,,	14 yrs.	1	,,	8 yrs.
2	between	11 and 12 yrs.	3	between	7 and 8 yrs.
1	after	10 yrs.	5	,,	6 and 7 yrs.
1	,,	9 yrs. 8 mths.	3	,,	5 and 6 yrs.

Six patients died without recurrence more than five years after operation. Thus:—

Details of Six Patients who Died More than Five Years after Operation Without Recurrence.

1 died at 14 years and 10 months from old age.
1 ,, 14 ,, ,, 4 ,, from apoplexy.
1 ,, 10 ,, from apoplexy.
1 ,, 7 ,, and 3 months from influenza.
1 ,, 7 ,, from cirrhosis of the liver.
1 ,, 5 ,, and 8 months from nephritis.

As there was no post-mortem examination, some may express a doubt about the case returned as dead from cirrhosis of the liver. This man was a life-long alcoholic and was known to have continued in his evil ways after the operation, and his medical attendant was himself sure that cirrhosis and not cancer was the cause of death.

There is no period at which a patient may be said to be free from the possibility of recurrence, but the likelihood diminishes rapidly after five years, and I always feel anxiety with regard to recurrence until that period has passed.

Details of 30 Patients who are Alive and Well Less than Five Years after Operation.

5	between	4 and 5 yrs.	8	between	2 and 3 yrs.
5	,,	3 and 4 yrs.	12	less than	2 yrs.

These results are brought out in percentages as follows:—

Five-year Period.—Out of 82 cases operated upon, and who survived the operation, 32, or 39 per cent., are either alive without recurrence, or are known to have died without recurrence.

Three-year Period.—Out of 97 cases 42, or 43·3 per cent., are alive and well without recurrence.

The remarks already made about the absence of selection for the operation of excision bear equally, but in the opposite sense, on the results as set out below:—

Details of 41 Patients known to have Died with Recurrence.

1	over	7 yrs.	5	between	3 and 4 yrs.
1	between	6 and 7 yrs.	3	,,	2 and 3 yrs.
1	,,	5 and 6 yrs.	15	,,	1 and 2 yrs.
1	,,	4 and 5 yrs.	14	less than	12 mths.

The intermediate health of the patients who survived for a year or more was usually remarkably good, and for the most part the symptoms of recurrence only appeared a few months before death. Those who died within the year were probably examples of continued disease, rather than the victims of recurrence.

MAKESHIFT OPERATIONS.

As has been already pointed out, my effort has always been directed to the carrying out of an excision, for though it sometimes appears to have little chance of leading to a long period of relief, it often turns out better than is expected, and usually gives the patient more complete and longer relief than an operation that leaves the growth, and aims at palliation by other methods. This preliminary statement is by way of explaining my title of *makeshift operations*, and is to prepare you for the sorry tale which I must now unfold.

It has not been my lot to meet with those long and unexpected periods of relief after palliative operations which others have often recorded. Indeed, were it so, I would suspect that I had been too reticent in my interference, too timorous and unenterprising. As bearing on this I have to record that in both cases that have survived after colotomy for four years and four months, and for three years, no portion was removed for microscopic examination, and there remains the element of doubt as to their pathology, though I had no sort of doubt at the time of the original exploration. In both cases the colotomy was carried out tentatively, and it was hoped that if they improved sufficiently, or did better than might be expected, a further operation would be carried out. One of the patients is reasonably well and content with the colotomy, and in the other extraneous circumstances have intervened to make it economically sounder for his family that he should not face the very considerable risk that a further operation would involve.

Results of the Makeshift Operations.

Short Circuiting.

45 cases with 9 deaths, or 20 per cent.
7 have not been traced.
29 are dead, the average duration of life being just under eight months. The longest survival was 2 years and 5 months.

Some Type of Colostomy.

40 cases with 15 deaths, or 37·5 per cent.
5 have not been traced.
4 are alive { 1 at 4 years and 4 months.
1 at 3 years.
2 are recent.
16 are dead, the average duration of life being just over eight months. The longest survival was two years.

Explorations only.

14 cases with 6 deaths, or 42·85 per cent.

Even in the presence of obvious dissemination interference may be called for to relieve symptoms due to obstruction, &c., and none need be denied the benefits of a timely palliative operation if by its means pain and discomfort can be relieved, so that they may be able to say with Don Quixote:—

> "Come Death with gently stealing pace
> And take me unperceived away,
> Nor let me see thy wished for face,
> Lest joy my fleeting life should stay."
> (*Translation from the Spanish by Charles Jarvis.*)

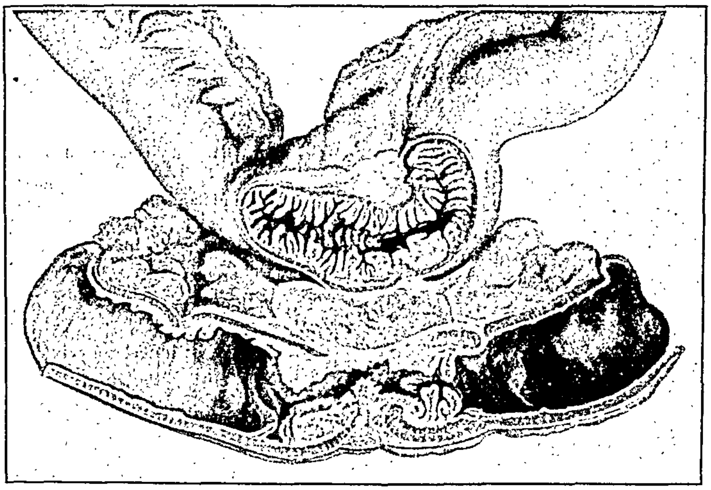
In the light of these results I would suggest: that excision holds out a good prospect of long relief; that it can frequently be carried out and with a lower mortality than palliative operations; that excision, even if followed by early recurrence, is the best palliative in most cases; that the operation of excision is much safer if carried out in stages; and that obstruction has usually proved a beneficent complication.

DIAGNOSIS.

When we come to deal with actual patients, this is the first problem we have to face. As surgeons, we constantly complain that cases of colon growth reach us too late, and on the other hand I am afraid we as constantly assume that they might have come much earlier. In my series no less than 62 of the cases have first come under my care with some degree of obstruction. So far as the patients themselves have been concerned, the first symptoms, or the symptoms which have culminated in an attack leading to the necessity for an abdominal operation, have been obstructive in character. In this particular group there have not always been the preliminary symptoms which one assumes must have been present. In other words, an attack of obstruction may be the first sign of the presence of a colon growth. Other patients have undoubtedly suffered for long periods from symptoms which, in the light of subsequent developments, can only be regarded as of a preliminary nature. These, again, fall into two very different groups: those who have *attacks* of obstruction, pain or hæmorrhage, which pass off and leave them in complete freedom for a varying time, during which they naturally congratulate themselves on their complete restoration to health; the other group who suffer from continuous disturbances, slight though they may be, of abdominal disorder of one sort and another. The more often I am confronted with the problem of making a diagnosis where the symptoms are not definite, the more am I impressed with the difficulties which present themselves, and the more and more do I sympathise with the position in which the medical man frequently finds himself.

The symptoms which suggest the presence of a bowel growth are well known, but the classical descriptions given in many books are only of the later stages, when the disease is already well established. The most important early symptoms are pain, in the form of attacks of mild colic, irregularity of the bowels in those previously regular (this usually means quite unexpected constipation); indigestion with bowel irregularity; considerable loss of blood and with any of these symptoms recurrence, in spite of intelligent treatment, and progressive loss of weight and vigour. I have not personally encountered many of the cases in which obvious anæmia has been a prominent early feature.

FIG. 3.



A growth of the summit of the sigmoid with a loop of involved small intestine. The operation was carried out in two stages and the continuity of the bowel restored. The patient is alive and well 4 years and 7 months afterwards. (Case 13 in list of multiple resections.)

What, then, are the routine steps to be taken when the symptoms indicate that suspicion of a bowel growth is well founded? The first and foremost is ordinary clinical examination. Of the abdomen in the first place for the presence of a lump, to estimate the significance of slight distension or fullness, and to carefully look for the presence of exalted peristalsis. Further, it must be a routine to search for evidence of that tell-tale dissemination which may be unexpectedly present, such as other lumps in the abdomen, deposits in the pouch of Douglas, peritoneal fluid, or a gland in the left posterior triangle of the neck. Rectal examination is always essential, for it may disclose a low-lying growth and, what is commonly forgotten, it reminds us of the necessity for bimanual examination, which may occasionally yield valuable information, even when carried out without anæsthesia. Secondly, inspection by the sigmoidoscope; thirdly, the result of an opaque enema or of a bismuth meal in this order; and, fourthly, inspection of the evacuations for mucus and blood.

I know how you would all welcome the announcement of some new test or the elaboration of some method for the more certain diagnosis of these cases, but I feel that I have often to plead unpopular causes, and I have now only to urge that when, in spite of the negative result of all these methods of examination, the symptoms continue, then the most valuable method *is repeated ordinary examination under varying conditions.* Over and over again a lump which is not to be felt at one time is only too obvious at another. Or on some occasion, and especially during an attack of pain, a localised contraction of the cæcum, or some other part of the large bowel, is perfectly obvious; whilst on other occasions, in the same patient, there may be nothing whatever to be made out. It is just because a repeated examination under different conditions is so important that one has to recognise that in this matter the general practitioner may be so helpful. It is often wiser to have these doubtful cases under observation in hospitals, whether private or public, and I cannot let this opportunity pass without saying how greatly we are hampered in our work in this country by the inadequate bed accommodation in surgical hospitals, so that we are robbed of the opportunity of that leisurely observation which is often so essential.

The most difficult and dangerous thing is to make a negative diagnosis and to say that because of the absence of signs under the various heads which have been mentioned, no growth is present. This causes a sense of artificial security, the patient may be content to be doctored or to doctor himself for many valuable months until some blatant development confirms the suspicion which has existed for long, but which makes the outlook for the patient considerably worse. This especially applies with regard to the negative result of radiographic examination, which I have no hesitation in saying is as yet, and in the hands of most people, the least valuable of the methods of diagnosis. As recently as eight years ago a prominent surgeon and teacher wrote as follows in connexion with this question:—

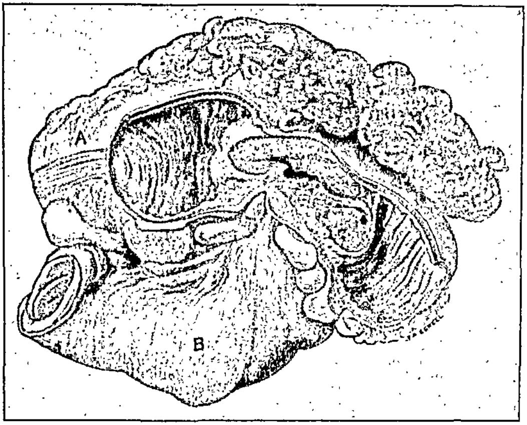
> "Although the disease runs a chronic course, and the sign-posts which point to its presence are generally obvious enough, it is surprising, as well as somewhat deplorable, to find so many cases do not reach the surgeon until the symptoms have culminated in complete obstruction. The symptoms ought to be sufficiently appreciated by the medical attendant to rouse his suspicion at any rate, and all he has to do is to call in the aid of a good radiographer who can not only settle the diagnosis but, what is equally important from the surgeon's point of view, can also demonstrate the position of the tumour."

I feel sure that no radiographer or clinician could entirely agree with the latter part of this statement to-day, but the impression has unfortunately not yet been eradicated from the minds of the public.

Before leaving this question I want to utter a warning about the use of the sigmoidoscope. It is frequently urged that this instrument should be in the hands of every practitioner, and should be used as freely as the laryngoscope, or even the tongue depressor! Its use is certainly not without danger, especially when it is passed blindly, as is sometimes recommended even at the present day. Many years ago I unfortunately perforated the sigmoid in two places with this instrument, and in spite of immediate laparotomy the patient died of peritonitis. Recently I had the curiosity to write to six of my surgical friends in various parts of the country, and as a result of their kind response, I have heard of four other cases in which the accident has occurred. This experience ought to be a sufficient warning.

When reasonable doubt exists and the methods of diagnosis prove inconclusive, an exploratory operation is certainly not only justifiable but indicated. Such an exploration must be very thorough. I have to confess that I have actually opened the abdomen, and have failed to discover a string carcinoma of the splenic flexure, which was found at a post-mortem examination some few days afterwards. The only bright spot in the dull picture is the fact that at the time of operation the patient was actually suffering from pylephlebitis, so that my oversight had really nothing to do with the unfortunate sequel.

FIG. 4A.



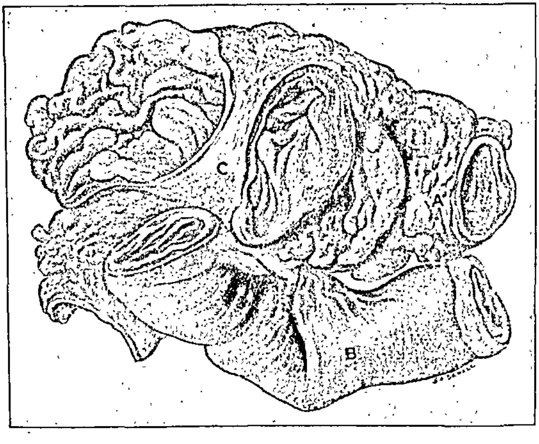
Carcinoma of the splenic flexure. A, involving a loop of jejunum: B, and also the stomach. Fig. 4B shows the portion of stomach C. The operation was done in two stages and the patient is alive and well 2 years and 4 months afterwards. (Case 16 in list of multiple resections.)

INVOLVEMENT OF THE GLANDS.

This seems a convenient place merely to mention one or two pathological matters that have a bearing on the management of these cases and on the after-results. Surgeons the world over are greatly indebted to those who have done so much to elucidate the vascular and lymphatic arrangements of the large bowel. The work of Jamieson and Dobson is universally recognised as a sure guide, and it is a great and well-deserved compliment that time and the experience and practice of all surgeons confirm their observations. The careful papers of Clogg are also most helpful.

From the point of view of living pathology I would just say that it is often impossible to express a naked-eye opinion of any value with regard to the lymphatic glands, as seen in situ. Obvious infiltration, as when colloid substance shines through their capsules, or when they are so crammed with growth that they are uniformly white and hard, is unmistakable. It is the significance of their mere enlargement which is so difficult to assess. At the outset of my operative career I became impressed by this in some cases of gastric cancer, for I learnt that suspicious-looking glands were as often as not merely septic or hyperplastic in nature. Later, I have come to believe that glands may probably overcome even an appreciable cancerous invasion.

FIG. 4B.



Same case as Fig. 4A. Shows the portion of stomach C.

The practical lesson I want to convey is the importance of not being deterred by the presence of these suspicious glands, and if an excision can be made without actually cutting through glands, then I do so, rather than not give the patient the chance of being relieved of an otherwise removable growth. In the case of one of my first excisions of the cæcum the glands and lymphatic vessels as high up as the point of ligature appeared to be invaded with growth, and yet that patient is to-day, 15 years afterwards, alive and free from recurrence.

In this series one of the growths was a sarcoma, the remainder being columnar-celled carcinoma. Only a small proportion were definitely of the colloid type.

In the concluding part of his Oration, which will appear in our next issue, Mr. Grey Turner deals with the Actual Management of Cases.

Oliver-Sharpey Lectures

ON THE

PHYSIOLOGICAL ANALYSIS OF SOME CLINICALLY OBSERVED DISORDERS OF MOVEMENT.

Delivered before the Royal College of Physicians of London

BY F. M. R. WALSHE, M.D., D.Sc. LOND.,
FELLOW OF THE COLLEGE; PHYSICIAN-IN-CHARGE OF THE NEUROLOGICAL DEPARTMENT, UNIVERSITY COLLEGE HOSPITAL, AND PHYSICIAN TO OUT-PATIENTS, THE NATIONAL HOSPITAL, QUEEN-SQUARE.

LECTURE II.*—THE TREMOR-RIGIDITY SYMPTOM-COMPLEX.

(*Delivered on May 2nd, 1929.*)

THE tremor-rigidity symptom-complex is seen in characteristic form in Parkinson's disease and as a sequel of epidemic encephalitis. In the latter condition frequently, and in the former occasionally, rigidity may be observed without visible tremor. On the other hand, tremor may dominate the clinical picture in either condition, but is never found without some rigidity in the muscles which produce the tremor. It is probable that the apparent separation of rigidity from tremor is not absolute, since the "cog-wheel phenomenon," so common in these circumstances, is almost certainly an expression of the disorder of innervation which, when present in greater degree, produces visible tremor.

In pure cases of the symptom-complex signs of disturbance of function in the pyramidal system are lacking, and we may assume that this component of the motor mechanism is intact. Considered, therefore, from Jackson's point of view we are dealing with an example of *local dissolution* of function in some one or more components of the neuromuscular mechanism subordinate to the pyramidal system. From what has been said earlier it will be apparent that the resulting disorder of function must be of the nature of a general reaction, in the sense that this has been defined.

In a preliminary classification of the disorders of motor function seen in a typical case of paralysis agitans, we may place under the heading of *defect symptoms* the following items: a certain slight but definite falling off in the force of voluntary movements, a slowing of the rate and a limitation of the range of voluntary movements, a damping down—amounting sometimes almost to extinction—of the normal movements of facial expression and of the limb gestures that may accompany them, and also of those accessory movements of the head, trunk, and limbs which accompany free voluntary movements of the individual as a whole, such as the swing of the arms and trunk in walking.

CHARACTER OF THE DISTURBANCES OF MOVEMENT.

It has been maintained by some authorities that there is a specific impairment or loss of these so-called automatic and expressional movements, as contrasted with what are called voluntary movements, and a special representation of the former groups in the basal ganglia has been postulated. Any distinction, other than one of degree, between voluntary and automatic movements is artificial. We may, perhaps, in Jackson's terminology, speak of some skilled acquired movement of the hand as "most voluntary and least automatic," or of some such simple movement as clenching the fist as "least voluntary and most automatic," but which of these qualifying terms is to be applied to a given movement must depend on the circumstances of its performance. Further, the view that a group of automatic movements has a special striatal localisation involves us in the hypothesis that a given movement comes to have two separate cerebral representations, cortical and striatal, or that at some undefined stage in the motor education of the individual such a movement changes its cerebral localisation from cortex to basal ganglia. Therefore, *followed to its logical conclusions*, the distinction between voluntary and automatic movements is seen to be wholly unphysiological.

Moreover, the clinical evidence affords no confirmation of the selective loss of movements defined as automatic. *All* movement is affected, and this according to a much simpler formula than the one above discussed. It is, in fact, the force with which a movement is normally carried out that seems to determine the degree to which it is damped down. The movements of facial expression afford a ready illustration of this generalisation. The normal play of expression over the face, when powerful emotions are not involved, is compounded of fleeting muscular contractions of minimal force, involving fractional activity of the muscles concerned and little expenditure of energy. That there is no true loss of these movements is revealed by their appearance in ample range if an adequate emotional stimulus be forthcoming. In such circumstances, a broad smile may be seen to dawn slowly on the previously immobile parkinsonian face, slowly to reach its maximum, and after an unduly prolonged stay as slowly to pass off. In less striking degree the movements of the trunk and arms accessory to normal walking may in a measure be brought out, and it is a common experience that under pressure of emergency or under stress of feeling the subject of paralysis agitans will abandon transiently his short-stepped, festinant, and monotonous gait for a free and rapid action in which the arms partake. There is, therefore, no loss of any movement, but there is a damping down of the range and speed of all movements and an apparent extinction of those which are normally of feeble intensity. Hence it is that in walking the accessory movements tend to disappear, leaving in action—themselves by no means unimpaired—only those primary components of the total movement-complex which are essential to the achievement of the subject's purpose.

If we now consider these primary and essential components—as we may call them—of a given purposive movement we find them to be abnormally slow in starting and in performance. They tend to decelerate progressively in many cases and may be brought prematurely to a stop in mid-course. For example, if the subject of a moderately severe grade of paralysis agitans be asked to remove his coat, we may see him become immobile with the garment only half doffed. A fresh effort is then needed to re-start and complete the interrupted movement. That this disability is not a measure of a loss of voluntary power in the muscles concerned may readily be demonstrated by requiring the patient to maintain some active posture of a limb against resistance. We find that he can, for example, maintain flexion at the elbow against powerful traction on the forearm.

Further, in the performance of such alternating movements as flexion-extension of the fingers, or pronation-supination of the forearm, we observe a progressive deceleration and decrease of range in each successive component movement until nothing but a tremulous oscillation round a fixed point remains. It seems almost impossible for the patient indefinitely to carry on any rhythmic movement of greater amplitude than that of the ordinary parkinsonian tremor.

Whereas in a normal subject carrying out some free unresisted movement the force exerted is maximal at the initiation of movement and thereafter wanes, it appears that throughout the whole course of a movement in the subject of paralysis agitans a maintained, or even a waxing effort is required to achieve completion.

Related to these difficulties in active movement must be the striking immobility of attitude which many individuals thus afflicted show, even under considerable cutaneous stimulation, such as contact with hot objects or the tickling caused by a fly crawling over the skin.

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* Lecture I. appeared in THE LANCET of May 11th.

If we attempt a generalisation of these peculiarities, we may say that while active postures can be maintained with approximately normal force, those muscular activities which necessitate free active changes in the length of the muscles—that is, lengthening and shortening of the constituent muscle-fibres—are seriously impaired. They are abnormally slow in initiation and performance, they are restricted in range, and may be brought to a stop before completion. In short, it seems that *in voluntary movement there is some impediment to changes in length of the muscle-fibres, but relatively little impairment of the power of the muscle-fibre to maintain tension at fixed lengths.*

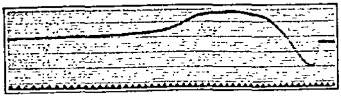
It seems necessary to qualify this generalisation by the introduction of the word "voluntary," since in the tendon-jerks and in the abdominal reflexes free muscular contraction of full range appears to take place at approximately normal speed. That is, the activation of the muscle-fibres by purely spinal reflex mechanisms seems able to produce contraction of the normal order.

Under the heading of *release symptoms,* tremor and rigidity must clearly come in our provisional classification, but there are one or two other characteristic symptoms which cannot yet be so easily placed in their proper category. Such are the festinant gait, the propulsion and retropulsion seen in so many subjects with paralysis agitans. The discussion of these may be deferred until we have considered the rigidity and its influence upon movement.

PARKINSONIAN RIGIDITY.

The salient features of this form of rigidity may be summarised as follows: (*a*) It is diffuse in distribution and lacks the selective incidence of spasticity and of decerebrate rigidity. (*b*) It remains of unvarying intensity through the fullest possible range of shortening and lengthening. There is no "clasp-knife" phenomenon—that is, no trace of lengthening reaction. (*c*) While it responds to sudden stretch by a tendon-jerk, sustained stretch does not produce clonus, and the graphic record of the knee-jerk lacks the "hump" characteristic of the spastic and decerebrate knee-jerks. (*d*) It is apparently wholly uninfluenced by afferent impulses arising in the labyrinths or in proprioceptors in muscles elsewhere. Therefore there is no trace of the tonic reflexes of Magnus and de Kleijn. (*e*) The rigidity is not subject to inhibition by intercurrent exteroceptive or cutaneous reflexes, but persists at a remarkably constant level unaffected by environmental stimuli of all kinds. (*f*) It is not accompanied by release of the spinal flexion or crossed extension reflexes, and the plantar responses remain of normal type. (*g*) Finally, it appears to be proprioceptive in origin, since de-afferenting the muscle by novocaine injections abolishes rigidity.

FIG. 1.



Graphic record of knee-jerk from a subject with parkinsonian rigidity. If the record be compared with those figured in Lecture I., it will be found to present a characteristic ascent curve, plateau, and curve of relaxation, all differing from these components of the normal and spastic knee-jerks. This record was made by Dr. E. A. Pritchard. Read from right to left. *Time-marker strokes correspond to 0·01 second.*

From this résumé it is clear that we are dealing with a form of tonic muscular activity profoundly different from that considered in my previous lecture.

The integrity of the afferent nerve-supply to the muscle appears essential to the development of any form of tonic muscular contraction. In observations recorded elsewhere [10] I found that the intramuscular injection of novocaine in a 1 per cent. solution into the belly of a muscle showing parkinsonian rigidity abolished this rigidity, while leaving the voluntary power of the muscle intact. The effect of this procedure, as Liljestrand and Magnus [7] have shown, is to paralyse the afferent nerves of the muscle while leaving the motor nerves intact. Thus a physiological de-afferentation is produced. Pyramidal spasticity is also abolished in this way, and we may therefore regard both forms of tonic contraction as proprioceptive in origin.

Prominent among the features in which parkinsonian rigidity differs from the forms of hypertonus considered in the last lecture are the lack of a reciprocal relationship between extensors and extensors, and an apparent immunity to many of the sources of inhibition that modify decerebrate rigidity and normal tonus.

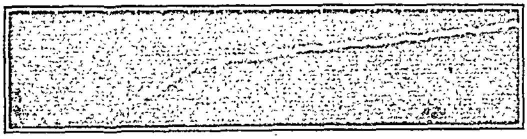
The occurrence of brisk tendon-jerks shows that the stretch reflex mechanism is active, while the form and time relations of the graphically recorded knee-jerk indicate that the inhibition which normally ensues upon sudden stretch excitation of the muscle is in operation. Yet the maintenance of this stretch does not produce clonus, a condition in which excitation and inhibition alternate. Similarly, the complete absence of the "clasp-knife" phenomenon—that is, the lengthening reaction—also points to some derangement of normal inhibition. Further, the facility with which decerebrate rigidity is transiently overset by cutaneous stimuli of various kinds is not found in parkinsonian rigidity.

Denny-Brown[8] believes that the inhibitory end-organ in the muscle is the muscle spindle, a structure so situated as to respond to passive changes in tension produced by muscular contraction. In this connexion the observations of Byrnes [8] may have some significance. Byrnes examined histologically pieces of the small hand muscles from rigid subjects of paralysis agitans, and records widespread and intense degenerative changes in the muscle spindles. He suggests, therefore, that the spindle must be a tone inhibiting organ, the destruction of which allows the development of hypertonus. At first sight the hypothesis is attractive, but on close analysis is found to contain insuperable difficulties in the way of its complete acceptance. Thus, in a single case of post-encephalitic parkinsonism with rigidity, the muscles examined by Byrnes revealed no lesion whatever of these afferent end-organs. If typical parkinsonian rigidity can develop in the presence of normal spindle innervation, the degeneration of the spindles in paralysis agitans cannot stand in any causal relationship to the rigidity. Further, a degree of spindle degeneration capable of resulting in rigidity must profoundly modify the curve of relaxation of the knee-jerk, since this relaxation is in part an inhibitory phenomenon. In fact, the observations of Pritchard, already referred to, show no such modification.

Finally, the mode of onset and the progress of paralysis agitans do not suggest that the underlying lesion is a degeneration of peripheral nerve-endings. Occasionally, a Babinski response is seen as a neighbourhood symptom in cases of post-encephalitic parkinsonism, and when not present may sometimes be produced as a transient phenomenon by the hypodermic injection of scopolamine.[11] Its occurrence in these circumstances is regarded as indicating a spread of the relevant pathological process in the region of the basal ganglia into the internal capsule. It is not possible to understand how this sign could appear were we dealing with a muscle spindle lesion. Even Byrnes himself is forced to invoke changes in the basal ganglia to explain the rigidity following encephalitis. Therefore, it is difficult to see how his observations can be correlated with the rigidity of paralysis agitans.

Striking as are the differences in behaviour of the rigidity of paralysis agitans, when compared with at rapid rates is from two to five per second, or more rarely as high as ten per second. The electromyogram reveals that this clonus is associated with an "abrupt tetanus of asynchronous volleys (of impulses) at the rate of 160 to 180 per second" consisting in all of some three to five volleys for each beat. It is possible, then, that the wave rhythm of voluntary innervation is of cortical origin. To this question we must later return.

FIG. 6.

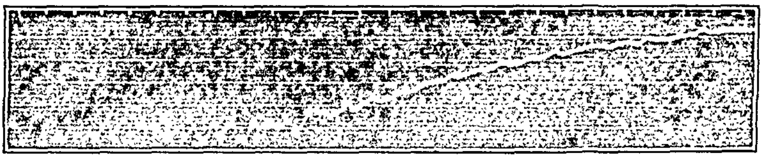


Curve of voluntary index flexor contraction from same subject as Fig. 4, but from opposite arm. No visible tremor. Rhythm 8·5 per second (arm less rigid than opposite arm) but accelerating and increasing in amplitude at turning point.

Is there any relationship between this normal rhythm and the cog-wheel phenomenon and tremor of paralysis agitans?

In the subjects of post-encephalitic parkinsonism without visible tremor a similar slow movement curve is obtainable. Fig. 5 is such a curve recorded on a smoked drum, while Fig. 6 is an optical record obtained from the same patient. Here the form of the curve is the same as the normal one, differing in that the waves are somewhat slower (7–8 per second) and of greater amplitude. There is no qualitative difference of any kind.

FIG. 7.



Curve of voluntary index flexor contraction from a case of paralysis agitans with rigidity and tremor. Rhythm 7 per second. Waves accelerate slightly and increase in amplitude as digit steadies at turning point. At this point a visible tremor appeared. In this subject resting tremor-rate 5 per second.

If we pass now to paralysis agitans with both tremor and rigidity we obtain such a curve as Fig. 7. Here the waves are still more ample, easily visible at the end of movement, and of an even slower rhythm (6–7·5 per second), which is that of the spontaneous tremor of the subject during movement. In this case the resting tremor was of a rate of five per second. Similar curves taken from a series of subjects with varying degrees of rigidity and tremor, and some without visible tremor, show every gradation between the normal amplitude and rate of wave and those illustrated in Fig. 7.

From these observations it seems a justifiable hypothesis that the cog-wheel phenomenon and the tremor of paralysis agitans and of post-encephalitic parkinsonism are not more than the exaggeration of a normal phenomenon. The slighter degrees of exaggeration are shown by the cog-wheel phenomenon alone, greater degrees by the appearance of tremor during the maintenance of postures, and the maximal degree in a free and ample tremor which is virtually constant. The slowing of the rate of beat is probably a result of muscular rigidity, to the degree of which it seems proportional.

The fact that this exaggerated beat tends in more rapid movements to be smoothed out even in the subject of visible tremor, as is seen in Fig. 8 obtained from the same patient as Fig. 7, tends to corroborate this view of the origin and nature of tremor. Further confirmation of the view is the fact that in many instances rapid movement of a tremulous member tends to obliterate tremor temporarily, while abrogation of cortical innervation as in hemiplegia also stops it.

As has been mentioned earlier, it is probable that the waves seen in the curves of voluntary contraction are of cortical origin, and that they stand in some relationship with the rate of discharge of the cortex. The electromyographic studies of Adrian and Bronk[1] indicate that with increased force of muscular contraction, either voluntary or reflex, there is a greater frequency of central efferent discharge to the muscle associated with a greater frequency of contractions in the individual muscle-fibres.

It may be that the waves seen in the curves of slow voluntary contraction express a slow rate of cortical discharge, while the disappearance of these waves in rapid movement is due to a more rapid rate of discharge from the cortex. In parkinsonian rigidity without visible tremor this wave fusion occurs less readily, while in paralysis agitans with tremor it does not occur at all, or only when extensive and rapid muscular contraction occurs.

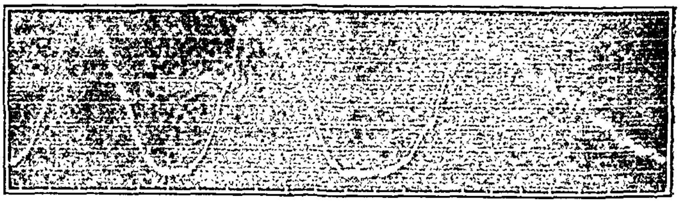
It may also be, assuming the rates of cortical discharge to be relatively little variable, that it is a function of some lower level nervous mechanism to "smother" the cortical rhythm, the impairment of this mechanism in paralysis agitans allowing this rhythm to come through. Possibly, again, both factors are at work in the production of tremor.

We may, therefore, reach this provisional conclusion that tremor is not a new phenomenon representing a mode of innervation peculiar to paralysis agitans, but is the emergence of a normal cortical rhythm through defect of lower level mechanisms.

If this view be well founded, we must conclude that there are factors underlying the development of tremor that play no part in that of muscular rigidity.

The observation referred to earlier, showing that tremor persists undiminished in the de-afferented muscle, whereas rigidity is abolished corroborates such a conclusion.

FIG. 8.



Curve of voluntary flexor extensor contraction at increasing speed. As in Fig. 3, from a normal subject *the waves wane in amplitude and tend to disappear as speed increases*, but they are not so readily "smothered" as in the normal subject. The curve at left represents the maximum possible speed for the subject.

One further point remains for brief consideration. Is tremor related to the ordinary proprioceptive clonus seen in spasticity and in decerebrate rigidity? Its persistence after de-afferentation of the tremulous muscle, and the absence of proprioceptive clonus in paralysis agitans both negative such a suggestion.

A further conclusion now seems justified—namely, that cortical activity is an essential condition of the appearance of tremor, but has nothing to do with that of rigidity, and, on the other hand, an intact proprioceptive system is essential to the development of rigidity, but not to that of tremor.

It is interesting to consider whether there may not be some common factor, a loss of function in some lower level mechanism, that, allowing tremor to appear on cortical activation, responds to proprioceptive influences by permitting the development of rigidity. The relationship cannot be such a simple one since it would involve the appearance of both phenomena in direct proportions, whereas we know that the relationship between the two tends to be an inverse one. We are probably not in a position to determine the nature of the factor or factors common to both, in the present state of knowledge.

CONCLUSION.

This completes the survey attempted on physiological lines of the two symptom-complexes we have been considering. It is clearly an incomplete one. To many of the questions raised, for example, that of the causation of parkinsonian rigidity, it has not been possible to provide a solution.

Probably others, pursuing the same method, will bring these problems nearer a satisfactory solution, but it will be by this means that they must ultimately be solved and not by those methods that were the subject of criticism in my last lecture. It may be urged that too great a part of these lectures has been devoted to these criticisms, largely destructive as they are. Yet the ground must be cleared of the luxuriant growth of speculation before we can hope to see the nature of the problems that confront us, and we must be delivered from the bondage of abstract conceptions that are out of touch with reality before our hands are free to deal with them.

It can only be by the careful correlation of clinico-pathological observations with the experimental physiology of the nervous system that now, as in the past, we can achieve a rational interpretation of the symptoms of disordered function produced by disease of the nervous system.

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TIME OF DAY IN RELATION TO CONVULSIONS IN EPILEPSY.

BY MARY LANGDON-DOWN, M.B., B.S. LOND.,

AND

W. RUSSELL BRAIN, D.M. OXF., M.R.C.P. LOND.,

ASSISTANT PHYSICIAN TO THE LONDON HOSPITAL AND TO THE HOSPITAL FOR EPILEPSY AND PARALYSIS, MAIDA VALE.

(From the Medical Unit, the London Hospital, and The Colony, Lingfield, Surrey.)

THE following paper contains the results of an investigation into the influence of time of day in causing epileptic convulsions. That epileptic patients are more liable to be convulsed at certain hours than at others, and that individuals vary in this respect, has of course been familiar for many years. Gowers[1] investigated this point in his large series of cases, and we shall have occasion to allude to his findings later. His method was to note certain broad facts concerning the time incidence of fits in his patients,—for example, whether they occurred by day only or by night only. Our approach to the question has been somewhat different and, in a sense, complementary to that of Gowers. We have subjected to detailed analysis the time incidence of the major fits in a group of 66 epileptics, living under similar conditions in the same institution, the hour of every major fit of each individual, 2524 fits in all, being recorded over a period of six months. A smaller group of patients in another institution have been similarly investigated over a period of two years, and the results used for purposes of comparison. Except where otherwise stated, the figures quoted are derived from the larger group.

All but five of the 66 patients were examples of so-called idiopathic epilepsy—that is to say, they presented no clinical evidence of organic disease of the nervous system. The remaining five patients comprised four cases of hemiplegia and one patient in whom epilepsy supervened upon a fracture of the skull. We shall briefly discuss these cases separately later, but as in respect of the subject of our investigation they showed no peculiarities to differentiate them from the rest of the group, their figures are included with the others.

General Classification.

We have already alluded to the distinction between patients whose attacks occur only or predominantly by day, and those whose convulsions are mainly, if not exclusively, nocturnal. We find also a third group in which the attacks occur both by day and by night. For brevity we shall refer to these groups as "diurnal," "nocturnal," and "diffused." The number of our patients is very small compared with Gowers's series, but it is interesting to find that the relative frequency of the three types among our patients is almost identical with that obtaining among his patients. These figures are given in Table I.

TABLE I.

Type.	Percentage of total (Gowers).	Percentage of total (present series).
Diurnal	45	42·5
Nocturnal	22	21·2
Diffused	33	33·3

A factor of subordinate importance which appears to influence the type of time distribution of fits is the duration of the disease. Table II. shows the incidence of the three types in patients grouped according to the duration of the disease.

TABLE II.

Type.	Duration under 10 years. Percentage.	Duration 10–20 years. Percentage.	Duration over 20 years. Percentage.
Diurnal ..	47	40	36·0
Nocturnal ..	28	20	21·5
Diffused ..	25	40	42·5

It will be seen that the longer the duration of the disease the greater the proportion of "diffused" as compared with "diurnal" and "nocturnal" types. There is thus a tendency for time to convert both the diurnal and the nocturnal types into the diffused type. Many patients, however, show no evidence of this tendency, for even after 20 years' duration of the illness 57·5 per cent. of the patients remain of the clear-cut diurnal or nocturnal type.

The close correspondence between Gowers' and our own series in respect of the incidence of the different types, and the persistence of the original type throughout the illness in a large proportion of cases, suggest that beneath these differences there exists a deeply-rooted distinction between the individuals composing the different groups. This is a point to which we shall return.

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[1] Gowers, W. R.: Epilepsy and other Chronic Convulsive Diseases. London, 1901.

Relative Severity of the Disorder in the Different Types.

The relative severity of the disorder in individuals of different types may be estimated as follows. If we calculate the average number of fits in the period investigated per individual for each group, we find that in the "diurnal" group there were 28 patients, having an average of 23 fits per patient in six months. In the "nocturnal" group there were 16 patients with an average of 48 fits per patient, and in the "diffused" group, 22 patients with an average of 51 fits per patient. Estimated thus, the severity of the disorder in those whose fits are solely or mainly diurnal is less than half that in the other two groups. Since the nocturnal occurrence of fits is common to both of the latter it may be said that the regular occurrence of nocturnal fits is a sign of bad prognosis. Corresponding probably to these differences in the severity of the disease, differences in the intelligence of the patients in the three groups were found. Patients in the diurnal group were somewhat more intelligent than the others, having an average intelligence quotient, actual or assessed, of 0·7, compared with 0·6 in the patients of the other two groups. Moreover, in the diurnal group 28·5 per cent. of the patients were neither mentally unstable nor deteriorating, while in the other two groups combined only 13·5 per cent. could be so described.

FIG. 1.

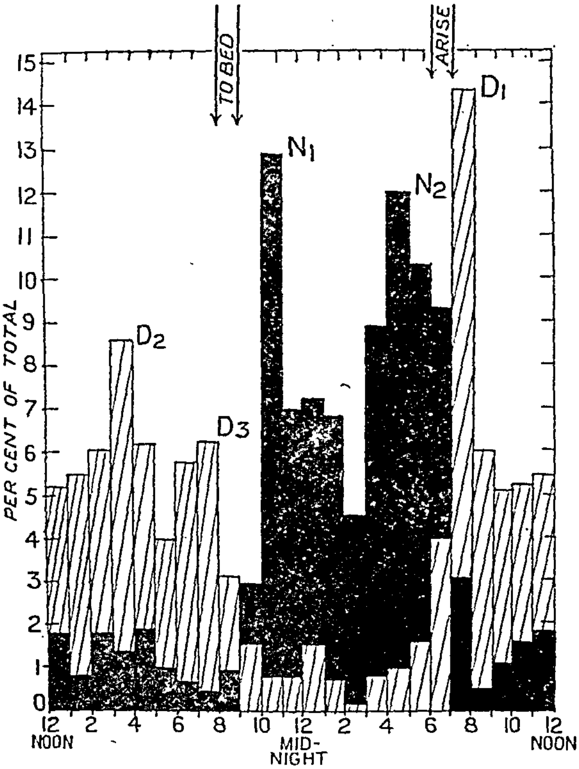


Chart showing the time distribution of the pooled fits of the patients in the diurnal and nocturnal groups. The ordinates are percentages of the total number of fits in each group over a period of six months. The abscissæ are hours of the day. The fits of the nocturnal group are represented in black, those of the diurnal group in cross-hatching. The patients arise between 6 and 7 A.M., the majority retire to bed between 8 and 9 P.M.

Time Peaks.

We now reach the most interesting result of the investigation—namely, the occurrence of "time peaks." By this term we mean that if either the attacks of individual epileptics or the pooled attacks of a group are recorded graphically, the resulting graph exhibits peaks occurring at certain hours of the day or night. To demonstrate this it is necessary to consider the diurnal and nocturnal groups separately (Fig. 1). The diffused group will be dealt with later.

Nocturnal Peaks.—The time incidence of fits in the nocturnal group is represented by the black areas in Fig. 1. This is seen to maintain a low level during the day, only about 15 per cent. of the total of fits in this group occurring between 8 A.M. and 8 P.M. Between 9 and 10 P.M. the number of fits is treble that in the preceding hour, and between 10 and 11 P.M. this rise is continued and intensified, to reach the first nocturnal peak, N 1. During the next hour the number falls to about half, and is maintained at this level until the hour 2 to 3 A.M., when there is a further fall. The second nocturnal peak, N 2, reaches its maximum between the hours 4 and 5 A.M., the number rising fairly sharply during the preceding hour. The fall is more gradual until 7 A.M., when the decline becomes precipitate, and in the subsequent hour, 8 to 9 A.M., the number reaches its lowest point in the 24 hours.

Individual patients may exhibit either or both of the two nocturnal peaks, N 1 and N 2. Most frequently N 2 alone is present, and this was the case in 13 out of 23 patients with well-defined peaks. Six patients showed both peaks, and four showed N 1 only.

Diurnal Peaks.—The time incidence of fits in the diurnal group is represented by the areas of cross-hatching in Fig. 1. Three diurnal peaks can be detected. The incidence of fits is lowest for the diurnal group of patients between 2 and 3 A.M. Thereafter there is a very gradual rise until 6 A.M., when it becomes much sharper, and between 7 and 8 A.M. occurs the first diurnal peak D 1, which was shown by 16 patients. During this hour occur about 14½ per cent. of the total fits of the patients in this group. The fall is almost as abrupt as the rise, and after 8 A.M. the incidence of fits is steady until 4 to 5 P.M., when the second diurnal peak, D 2, occurs. This peak is followed by a fall to somewhat below the usual level for the day, with a subsequent rise, D 3, at 7 to 8 P.M., before the fall to the low nocturnal level.

Peaks in the Diffused Group.—Examination of the charts of individuals of the diffused group reveals that they fall into two classes. A few patients in this group exhibit some of the peaks already described, usually one or both of the nocturnal peaks, with the addition of a considerable number of fits during the day. The majority, however, show no special time incidence in their attacks which appear to occur indiscriminately at any hour of the day or night.

Individual charts illustrating the various classes of epileptic are reproduced in Figs. 2 to 5.

Interpretation of the Peaks.

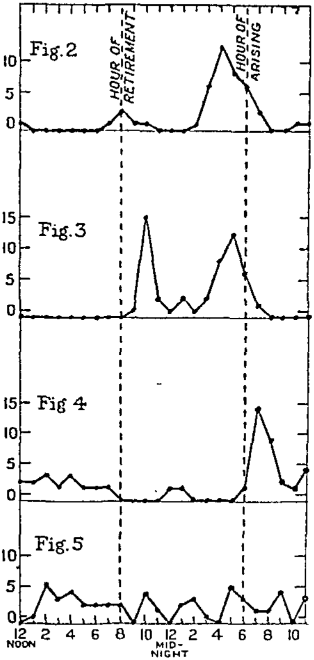
The special liability of epileptics to be convulsed at certain hours of the day and night is a problem of great interest and importance which we are at present not in a position to elucidate by any means fully. We shall first consider the interpretation as far as is possible of the individual peaks, and we shall then briefly indicate the direction in which it appears to us that further elucidation must be sought.

Peak N 1.—The patients who form the subject of this communication live in four separate houses and do not all retire to bed at the same time. Their bedtime ranges from 6 to 9.30 P.M. The majority of those exhibiting the N 1 peak go to bed between 8 and 9 P.M. This peak attains its maximum between 10 and 11 P.M., which is for most of the patients the second hour after retiring to bed. There is no direct evidence available in our cases as to the relation to sleep of fits occurring at this time; but it seems probable that the peak N 1 is the response of certain patients, either to the act of falling asleep or to the early stages of sleep itself.

Peak N 2.—This peak, which begins to rise at 3 A.M., attains its maximum between 4 and 5 o'clock. Any explanation of this increased tendency to fits in the latter part of the night must at present be purely speculative, but certain negative inferences can be drawn from the mode of decline of the peak. It is seen to fall slowly from 5 to 7 A.M., and thereafter much more rapidly. The patients in question arise between 6.30 and 7 A.M., so that the sharp fall in this peak corresponds to the period of awakening and getting up. It is unlikely therefore that the rise of peak N 2 is due to a tendency of the patients to awaken spontaneously during the latter part of the night and to be convulsed on awakening. If this were the case the peak would continue to rise until after the time of getting up. Actually we find that in this group the incidence of fits is falling during the two hours preceding getting up and falls still more sharply during the subsequent hour.

Peak D 1.—This peak is a very abrupt one, reaching its maximum between 7 and 8 A.M., a period which begins half an hour after the patients arise. The conclusion seems *inevitable that in this group* awakening and arising act as strong precipitants of convulsions. At present it seems impossible to analyse these precipitating factors further. It is well known that some patients may be convulsed at the moment of awakening. This may contribute to the rise of the earlier part of this peak, but its maximum is attained during the subsequent hour. There seems no reason, however, why this should not be a deferred effect of awakening. Gowers discusses how far the assumption of the erect posture on getting out of bed may be a precipitating factor in patients who have fits soon after arising, and concludes that it is unimportant because such patients are often convulsed at the usual hour even though they remain in bed.

FIGS. 2–5.



Representative charts showing the time distribution of the fits in individual patients over a period of six months. Ordinates, number of fits: abscissæ, hours of the day. Dotted lines indicate hours of retirement to bed and of arising.

FIG. 2.—A patient of the nocturnal group, exhibiting the peak N 2 only.

FIG. 3.—A patient of the nocturnal group, exhibiting the peaks N 1 and N 2.

FIG. 4.—A patient of the diurnal group, exhibiting the peak D 1.

FIG. 5.—A patient of the diffused group.

Peaks D 2 and D 3.—These peaks are comparatively small and occur in only a small proportion of patients. They are found at approximately the same interval, three to four hours, after the second and third meals of the day, but there is no evidence as to their cause.

Epilepsy associated with Gross Organic Lesions.

As we have already stated, five patients in our series were examples of the association of epilepsy with gross organic lesions, four being examples of infantile hemiplegia and one having developed epilepsy after sustaining a fracture of the skull during the war. The four cases of infantile hemiplegia belonged to the nocturnal group, two showing the peak N 1 and two the peak N 2. The patient with traumatic epilepsy belonged to the diurnal group and exhibited the D 1 peak. There was no feature of the time incidence of their fits peculiar to these patients with a gross organic lesion, and we have therefore included them with the rest. No conclusion can be drawn from so few cases, but this evidence supports the view that in cases of traumatic epilepsy there is a constitutional disturbance which is common to these cases and to the cases of so-called idiopathic epilepsy, for we can distinguish in both groups similar variations in the time incidence of the convulsions.

Influence of Sedative Drugs on the Time Distribution of Convulsions.

It is natural to inquire what influence, if any, the administration of sedative drugs exerts upon the time distribution of the convulsions, and on investigating this point we find as far as can be ascertained their influence is negligible. This, of course, does not mean that the total number of fits is uninfluenced by drugs, but that the characteristic time peaks occur in spite of the exhibition of sedatives at such times as have been judged most suitable for their prevention. The method of administration of sedatives to the patients to whom our records refer has been to give bromides, and in a small number of cases luminal in the morning, at night, or at both times. The average daily dose per patient was grs. 18 of potassium bromide and gr. ½ of luminal. The general plan has been to give the larger and in some cases the sole dose at bedtime, when the patients' fits were mainly nocturnal, and in the early morning when the convulsions occurred principally by day. As may be seen from Fig. 1 and from individual time-charts, this mode of administration has not prevented the occurrence of well-marked time peaks. The possibility was considered that the administration of a large dose of bromide or luminal at bedtime might be responsible for deferring the rise of peak N 1 for some hours and so causing peak N 2. This, however, seems unlikely when we consider that both peaks not infrequently occur together in the same patient, and that three patients who exhibited the N 2 peak were receiving no sedative in the latter part of the day. No one will gainsay that bromides and luminal diminish the total number of fits in the majority of patients, yet we find the *time distribution of the fits little if at all affected.* It would appear therefore that these drugs, administered by the method described, suppress a proportion of the fits completely but do not defer any to a later hour. Thus they do not smooth out the inequalities of time distribution which constitute the time peaks.

General Conclusions.

We have seen that approximately two-thirds of a group of 66 epileptics manifested a marked difference in the diurnal and the nocturnal incidence of their convulsions, and approximately three-fifths exhibited one or more "time peaks,"—that is, a concentration of their attacks at or around certain hours. Five such peaks have been recognised, two nocturnal and three diurnal. The second nocturnal peak (maximum 3–4 A.M.) is the most frequent and was found in 35 per cent. of patients; the first nocturnal peak (maximum 9–10 P.M.) occurred in 18 per cent. These two peaks were found together in 13·6 per cent.; the first nocturnal peak occurred alone in 4·5 per cent., and the second alone in 21·2 per cent. The principal diurnal peak, D 1 (maximum 7–8 A.M.), occurred in 24·2 per cent. of patients.

Reference to Fig. 1 reveals certain marked contrasts between the patients of the nocturnal and the diurnal group. Not only is their response to day and night in general diametrically opposite, but this antithesis extends to points of detail as is well shown by the behaviour of the two curves between the hours 4 and 7 A.M. This is the period of awakening and arising from bed. During this period the incidence of fits in patients of the nocturnal group falls from the highest but one level of the 24 hours to the lowest. In the diurnal group it rises from almost the lowest to the highest. It is natural to inquire what is the factor to which the two groups are responding in opposite ways. An answer to this question is rendered difficult by the coincidence in time of at least three important functional changes: (1) the change from sleep to waking, (2) the change from the supine to the upright posture, and (3) the change from inactivity to the motor activities of dressing, &c.

The contrast between the two groups is demonstrated in an equally striking fashion by comparing the response of the nocturnal group to bedtime and sleep with that of the diurnal group to awakening and arising. The former is expressed by the black areas in Fig. 1 between the hours of 8 A.M. and 2 P.M., the latter by the areas of cross-hatching in the same figure between the hours of 5 A.M. and 11 A.M. The marked resemblance between the two curves indicates that a similar pathophysiological effect is produced in the one group by retirement to bed and the onset of sleep, and in the other by awakening and getting up.

It is tempting to consider these facts in relation to what is known of the physiology of sleep, but any such correlation must be purely speculative. Pavlov's conception of sleep as widespread cortical inhibition is now well known. The rôle of inhibition in the physiology of convulsive states has aroused interest for many years, but is one of the most difficult problems in neurophysiology. It may be that the difference between patients in the diurnal and nocturnal groups is a difference in the effect of the inhibitory factor of sleep upon their convulsive tendency. This, at least, is one direction in which we look for more light upon these phenomena. Biochemistry affords another avenue of approach to the problem. There are indications that both sleep and inhibition possess a biochemical basis. It would be difficult otherwise to explain the action of sedative drugs. The bromides not only induce sleep but also, as Pavlov has shown, strengthen cortical inhibitory processes, thereby affording strong indirect support for his identification of sleep and inhibition. Little is known at present concerning the biochemistry of normal sleep, but further knowledge of both general and cerebral metabolism in the sleeping state may help to explain the striking but obscure relationships between sleep and epilepsy.

Summary.

1. The influence of time of day in precipitating major or epileptic convulsions has been investigated in 66 epileptic patients.

2. It is found that they fall into three groups—namely, those in which the attacks are mainly diurnal, mainly nocturnal, or occur indifferently by day and night.

3. Attacks are more frequent in the last two groups than in the first.

4. The term "time peak" is used to describe the increased tendency to convulsions at certain hours.

5. Five such time peaks can be recognised, three diurnal and two nocturnal. Their interpretation is discussed.

6. Patients of the "diurnal" and "nocturnal" groups are found to respond in an opposite manner to the onset and cessation of sleep.

7. Five patients suffered from organic lesions of the nervous system. No distinction in respect of the time incidence of fits can be drawn between these and the 61 cases of "idiopathic" epilepsy.

We desire to express our thanks to Dr. J. Tylor Fox and Dr. R. Langdon-Down for kindly allowing us to use the records of their patients for this investigation, the expenses of which were in part defrayed by a grant from the Medical Research Council.

THE
EXCITABILITY OF THE RESPIRATORY CENTRE OF PSYCHOTIC PATIENTS.

BY R. G. B. MARSH, M.R.C.S. ENG., D.P.M.,
ASSISTANT MEDICAL OFFICER, CLAYBURY MENTAL HOSPITAL.

THIS paper contains an investigation of the excitability of the respiratory centre in certified cases of insanity. Observations made on various cases of psychosis at the Central Laboratory at the Maudsley Hospital have furnished evidence that a state of disturbance of the acid-base equilibrium is characteristic of a large number of psychotics. Studies of the blood-sugar curves,[1] the vasomotor responses,[2 3] of the pH of the urine after sleep and after ingestion of food,[4] the responses to insulin and other drugs have all tended to show that a failure of the acid-base equilibrium exists and that this condition closely resembles that obtaining during sleep in the normal individual.[5 6 7]

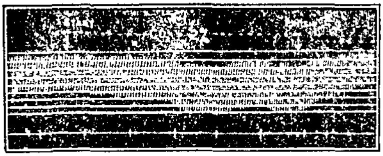
Using an electrically controlled plethysmograph devised by Golla it was shown in a recent paper [8] that the determining factor in this condition of disturbed acid-base equilibrium is a lowered excitability of the respiratory centre to the stimulus of carbon dioxide. The present paper records a further investigation of the occurrence of this depression of the respiratory centres which I have made in a large number of cases of certified insanity in Claybury Mental Hospital.

Method.

The method used was the same as that adopted in the previous investigation. It was found convenient to substitute rubber spear-head valves of the type used in the army gas-protection outfit for the Chauveau valves in Golla's automatic plethysmograph, and with this improvement, since the valves no longer had to be fixed in an immovable position, it was no longer necessary to have a long tube with a consequent dead space leading from the nose to the valves. As has been pointed out in the previous investigations. the great merit of the automatic plethysmograph with the nasal leads is that it favours the continuance of normal respiration and is in fact so little felt by the subject that various patients have been known to go to sleep during an experiment.

An examination was attempted at Claybury on all new male admissions and on every case in two chronic male wards irrespective of the mental condition of the patients. As was to be expected it was found impossible to obtain reliable records from a large number of the patients examined owing to resistiveness, negativism, and in some cases mania. Again, in some few cases reliable results were not obtained owing to the patient obviously having his respiratory mechanism upset by the fact of having an experiment performed, the error usually introduced being one of overbreathing. The normal controls were obtained from the medical and male nursing staff at the Maudsley Hospital and Claybury Mental Hospital.

The subjects were introduced to the apparatus and allowed to examine it; they were then made to lie on a couch with the apparatus slightly behind them and the gasometer out of the range of vision. The nose-piece was introduced and the subject given a few minutes to accustom himself to it. The apparatus was then connected up and no attempt at recording the result was made until the respirations were regular. The first reading taken was regarded as a trial and was discarded and the second and subsequent readings were used for the process of calculation. In many cases the readings used were taken on days subsequent to the subject's introduction to the apparatus.



Record of normal response to 2 per cent. CO_2. Parallel horizontal lines represent calibrations in terms of 100 c.cm. Time in minutes.

Results.

The results were calculated by measuring the total excursion of the recording stylus on the record for one minute previous to the administration of the CO_2 and for the fifth minute after the CO_2 had commenced. This was reduced to terms of the total ventilation per minute by means of calibration and the result is expressed as the percentage increase of volume of respiration over the normal.

It was found that subjects who increased their ventilation to CO_2 responded in a varying manner; some increased the rate of respiration, some increased the volume of each separate respiration, and a third group responded by a mixture of both methods. The figure shows a typical response of a normal subject to 2 per cent. CO_2.

The Normal Response.—Twenty-five normal male subjects were examined and gave the results shown in Table I.:—

TABLE I.

Increased % ventilation to 2 % CO_2 ..	0–5 %	5·5–10 %	10·5–15 %	15·5–20 %	20·5–25 %
Number of subjects..	1	2	9	7	6

Thus 88 per cent. of the normals respond to 2 per cent. CO_2 by an increase of over 10 per cent. of the total ventilation, 8 per cent. by an increase of over 5 per cent., and 4 per cent. (a single case) increased by less than 5 per cent. This case, an apparently normal individual, increased his ventilation 2·1 per cent.

Of a total of 140 psychotic patients examined reliable results in which the patient could be induced to coöperate intelligently were obtained in 73 cases. The diagnoses in the following tables were those officially recorded on the hospital records. It will, of course, be obvious to anyone with a knowledge of clinical psychiatry that such diagnosis in the case of newly admitted patients must be regarded as to a great extent provisional and in the present state of psychiatrical classification subject to the individual bias of the observer.

Two groups of cases are considered separately: those suffering from congenital mental deficiency and those suffering from epilepsy.

Six cases of congenital mental deficiency were examined, one of them being also the subject of epilepsy. Of these six one case fell in column 1 of Table II., one in column 2, three in column 3, and one in column 4. The number examined is, of course, too small to permit of any conclusion being drawn.

TABLE II.

Increased % ventilation to 2 % CO_2 ..	0–5 %	5·5–10 %	10·5–15 %	15·5–20 %	20·5–25 %
Dementia præcox ..	17	6	2	—	1
Melancholia.. ..	13	4	—	—	—
Mania	1	—	—	1	—
Manic depressive ..	2	—	—	—	—
Senile dementia ..	1	—	—	—	—
Alcoholic psychosis .	—	—	1	—	—
Dementia præcox with epilepsy ..	—	—	1	—	—
Total	34	10	4	1	1
Percentage round figures	68 %	20 %	8 %	2 %	2 %

Sixteen cases of epileptic insanity were also examined. The following table shows their response to CO_2.

TABLE III.

Increased % ventilation to 2 % CO_2 ..	0–5 %	5·5–10 %	10·5–15 %	15·5–20 %	20·5–25 %
Number of cases ..	6	1	1	3	5

The number of cases is, of course, small, but the increase at each end of the table gives some indication of the possible existence of two groups of patients among the insane suffering from epilepsy, one group showing a tendency to a normal, and another with a psychotic form of reaction. Further investigations on this subject are being pursued.

It has been previously stated that an increased total ventilation in normal subjects may be accomplished either by an increased frequency or an increased depth of respiration, or by both factors acting simultaneously. An examination of the curves obtained from the psychotic patients failed to reveal any preponderance of one or other factor in any particular form of psychosis. No correlation between the conduct of the psychotic during examination and the response to 2 per cent. CO_2 could be detected—some of the cases were excited, others depressed or katatonic, and others outwardly normal. The diminished excitability of the respiratory centre cannot therefore be interpreted as a mere bodily sign of a psychical condition, but must be regarded as a particular symptom of a bodily syndrome of which the psychosis is the salient feature.

Since writing this article I have seen a paper by Loevenhart, Lorenz, and Waters[9] who state that by stimulating stuporous cases of dementia præcox with from 10–15 per cent. CO_2 in 85–90 per cent. oxygen they have succeeded in temporarily improving their mental state.

In conclusion, I should like to express my gratitude to Dr. F. Golla for his great help in the writing of this paper and under whose direction the work was carried out. In addition I wish to thank Dr. G. F. Barham, superintendent of Claybury Mental Hospital for the facilities given and the interest shown in this investigation.

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Clinical and Laboratory Notes.

A NEW INDEX OF INTESTINAL PUTREFACTION.

BY N. MUTCH, M.D. CAMB., F.R.C.P. LOND.,
PHYSICIAN TO GUY'S HOSPITAL.

THE definition of intestinal toxæmia as a clinical entity is beset with difficulty. To many the symptomatology seems cumbersome and vague. Chemical tests have proved unsatisfactory, because they have failed to discriminate between minor degrees of toxæmia and those which are significant. Ethereal sulphates are merely a measure of the total aromatic flotsam and jetsam which reaches the ileocæcal region. The tests for indican and urorosein are too sensitive, not only chemically, but also in the clinical sense. They depend upon the occurrence in the urine of products derived from tryptophane. It is only during the latest phases of digestion that trytophane is liberated from the protein complex. If there should be a little weakness in the digestive ferments, a little rise in the bacterial level in the gut, or if the food should pass too quickly through the ileum, unabsorbed tryptophane will come into contact with bacteria of the coli group, and indican or urorosein appear in the urine.

The test about to be described discriminates between the trivial and the serious. A positive result is not obtained unless putrefaction is of some moment. It also furnishes evidence of the absorption of intermediate products of bacterial action, and it is amongst these more elaborate compounds that the most poisonous substances are to be sought. The end-products, phenol, indoxyl, and so forth are relatively inert.

In contrast to tryptophane, which is one of the last crystalloids to be split from the protein molecule, tyrosin is liberated at a very early stage in digestion. If intermediate products of tyrosin putrefaction appear in the urine, it can be assumed that a great part of protein digestion is proceeding in a contaminated medium instead of under the normal aseptic conditions of health. The two first stages in the disintegration of tyrosin yield tyramine and the corresponding hydroxyacid. Both substances appear in the urine in the same form because tyramine is converted by the liver into the acid before excretion. This substance, *p*-hydroxyphenyl-acetic acid was first isolated from the urine by the author some years ago [1] and furnishes the chemical basis for the test.

Test.—To 50 c.cm. of urine add 5 c.cm. of 25 per cent. sulphuric acid and extract by shaking with 15 c.cm. of ether. Pour off 2 c.cm. of the ether into a dry tube and evaporate by dipping into hot water. Take up the residue in 2 c.cm. of water. Add Millon's reagent drop by drop and boil. A positive reaction is indicated by red coloration. (The quantities mentioned are approximate and need not be measured carefully.)

Quantitative significance.—Some idea of the amount of absorption of tyrosin intermediate products which is actually taking place can be gained by comparing the depth of the colour reaction with that obtained from the urine of a normal subject after the ingestion of tyramine. A daily excretion corresponding to half a gramme of tyramine is by no means rare.

Pitfalls and fallacies.—Simple phenolic end-products are commonly found in urine and give a positive reaction when the Millon test is applied to untreated urine. They are insoluble in ether and therefore do not interfere with the reaction when carried out as described. Many cheeses contain preformed tyramine. A positive reaction cannot therefore be regarded as evidence of tyrosin putrefaction in the bowel if cheese has been taken during the preceding 24 hours. Aspirin and salicylates give a similar reaction and should be excluded. Their presence is easily revealed by making a duplicate ethereal extract and noting the purple colour produced with ferric chloride solution.

Prevalence.—A series of urines from 308 unselected patients in the medical wards at Guy's Hospital was examined with the following results: positive reactions, 42 per cent.; negative or doubtful, 58 per cent.

Relationship to indican reaction.—Faults in digestion of one degree or another are very common amongst patients of all classes and lead to indicanuria. In the present series positive reactions for indican or urorosein were given in 81 per cent. of cases, but in only one half of these patients did the process of putrefaction extend to the tyrosin molecule. Indicanuria without tyrosin-acid excretion was frequently noted, but a positive tyrosin-acid reaction was rarely obtained in the absence of indican or urorosein. It was only noted in two cases—that is, in less than 1 per cent. of the series.

It would thus appear justifiable to look upon this reaction as an index of bacterial activity more extensive in degree and scope than that associated with simple indicanuria.

Its relationships to some of the common causes of putrefaction in the bowel were investigated in a smaller series of cases. For this purpose cases were selected which showed definite tyrosin-acid reactions, and an approximate estimation was made of the total daily excretion on average diet in terms of tyramine.

Ileal stasis.—This condition facilitates the invasion of the small intestine by bacteria from the cæcum. Taking one case with another, tyrosin decomposition is greatest when stagnation in the ileum is greatest.

Cases.	Ileal stasis (emptying time of ileum).	Proportion of cases showing the following daily excretions of tyrosin acid.		
		0·4 g.	0·2 g.	Less than 0·05 g.
10	Greater than 10 hours.	20 %	60 %	20 %
5	8 to 10 hours.	0 %	20 %	80 %

Infection of the ileum by organisms of the Coli group.—Samples of chyme were obtained from the ileum at operation and the density of the flora measured by cultivation. The cases in which infection was severe and a loopful of chyme yielded 500 or more colonies of coliform organism gave an average reaction equivalent to 0·22 g. tyramine. Where the infection was mild and a loopful of chyme yielded 5 colonies or less the excretion was equivalent to 0·13 g. tyramine.

Acidity of the gastric juice.—In the absence of hydrochloric acid digestion is slower and more unabsorbed food reaches the ileocæcal region. Hypochlorhydria indirectly furnishes the colon with a rich culture medium and encourages putrefaction.

Ewald test-meals were carried out on 21 patients who were known to excrete tyrosin acid, and the following observations recorded.

Cases.	Active HCl.	Average daily excretion (in terms of tyramine).
	Per cent.	
5	0·2 to 0·3	0·17 g.
9	0·1 ,, 0·2	0·13 g.
7	Nil ,, 0·1	0·23 g.

Lack of acid in the gastric juice was associated with a pronounced increase in the excretion of tyrosin intermediate products.

In brief, the excretion of tyrosin acid is definitely encouraged by ileal stasis, *B. coli* infection of the ileum, and by hypochlorhydria. It is doubtless encouraged by many other factors which promote saprophytic activity in the gut, but these three examples will suffice to indicate the direct clinical association between the reaction described and putrefactive processes in the bowel. Only qualified inferences can be made from a negative finding. Much abnormal decomposition may occur even when this particular urine reaction is negative because only a limited number of bacterial strains have the power of destroying tyrosin. A positive finding, however, is always significant. The suggestion is that a positive finding should be regarded as evidence of serious absorption of bacterial products from the colon or small intestine.

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[1] Jour. Physiol., 1914, xlix., p. ii.

INTRANASAL IMMUNISATION AGAINST SCARLET FEVER.

By B. A. Peters, M.D., D.P.H. Camb.,
MEDICAL OFFICER IN CHARGE, HAM GREEN HOSPITAL AND SANATORIUM, BRISTOL; LECTURER IN FEVERS, UNIVERSITY OF BRISTOL;
AND
S. F. Allison, M.B. Edin., D.P.H. Camb.,
LATE FIRST ASSISTANT MEDICAL OFFICER, HAM GREEN HOSPITAL.

As many people have a rooted objection to hypodermic inoculations and as the reactions produced by scarlet fever toxin are decidedly unpleasant, we have investigated the possibility of producing immunity to scarlet fever by the application of scarlet fever toxin to the nasal mucous membrane. For many months we have tested all cases of diphtheria with the Dick test on admission, as knowledge of their susceptibility or otherwise to scarlet fever is of great value in controlling any outbreak of that disease in a convalescent diphtheria ward—an ever-present anxiety in fever hospital practice. We have used for this investigation patients with a strong initial positive.

The method employed is to spray the nose every other day by means of an atomiser with the scarlet fever toxin, "B" strength, supplied by Messrs. Burroughs Wellcome and Co. (5000 skin test doses per 1·0 c.cm.). The nose is first sprayed with a solution of 1 per cent. sodium taurocholate with the aim of aiding absorption. During one period of the investigation this preliminary was omitted and decidedly inferior results followed. As the average time in hospital of diphtheria cases is five weeks we re-tested at the end of that time those who had been sprayed. Nine of those who still gave positive results were re-tested a fortnight later, as they were still in hospital. Out of the first 52 cases half were used as controls, taking alternate cases. Ten new members of our staff with positive tests were also used; half of them became negative on re-test and are not included in the table of results given below.

Results on Dick Test.

—	Number.	Negative.	Much reduced.	No change.
Spray cases ..	61	22	24	15
Controls	26	1	2	23

Five of those marked "much reduced" were re-tested a fortnight later, when three of them gave completely negative tests and two showed no further change. Four of those recorded as "no change" were also re-tested a fortnight later, when one of them gave a reduced test and three still remained strongly positive. As we have pointed out on a former occasion that three skin-tests may convert a positive into a negative,[1] we do not feel inclined to stress the result of these repeated re-tests.

An interesting difference in the anatomical site of the reaction was noted in those marked "much reduced"; this was only observed in two control re-test cases and never in the initial tests, and was certainly not due to a technical error in the test. An initial positive Dick-test in a child with a thin skin shows itself as a brilliant homogeneous patch of erythema from 2 to 5 cm. in diameter with a well-defined edge, situated in the extreme superficial layers of the skin. In the "much reduced" cases the area was much smaller, less definite, less brilliant in colour, and with the appearance of being much deeper seated, as though viewed through the superficial layers of the skin. We are disposed to think from the second re-tests that this type of reaction indicates the *beginning of immunity* and that, if we had had an opportunity to continue the spraying for a longer period the proportion of complete negatives would have been doubled and would have approximated to the numbers rendered Dick-negative by the end of the fifth week of an attack of scarlet fever. This, as we showed previously, is only 70 per cent.

During the investigation two small outbreaks of scarlet fever occurred in a convalescent diphtheria ward of 40 patients. None of those rendered negative contracted the disease, but five controls and three who had been sprayed and were still positive after five weeks contracted it. These last three cases show that the spraying does not produce local tissue immunity, as is claimed for the ingestion of dead cultures of *Bacillus typhosus*, but that a general antitoxic immunity must develop before the patient is immune. However, one of these attacks was so extremely mild that, had it not occurred during this outbreak, we might have thought it to be an allergic reaction due to the toxin itself and not true scarlet fever.

We are continuing this investigation, using a more concentrated toxin and only spraying twice a week. So far the results seem to be the same as those obtained by spraying every other day.

We have no means at our disposal to prove the duration of the immunity, as our patients are only under our care for a brief period, but someone in charge of a resident institution may, we hope, give the method a trial—spraying, say, twice a week for eight weeks—as this method of immunisation is free from the objections of inoculation, and produces no *observable effects whatever on the patient except* the development of immunity in a considerable proportion of cases.

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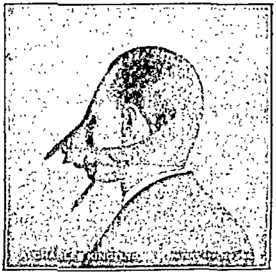
[1] Brit. Med. Jour., 1928, ii., 4.

New Inventions.

A RETENTION APPARATUS FOR ANÆSTHETIC MASKS.

When giving gas-oxygen anæsthesia the need is often felt for a means of retaining the mask in place. Not only may this be tiring to the anæsthetist in long operations, but he may need his hands free for changing cylinders, moving the patient, or giving spinal or other injections. The simple fitting here illustrated is adapted for use with any ordinary mask; it can be easily washed or boiled, and will maintain a firm, even pressure of the mask in most cases, with little tendency to slip or to cause respiratory obstruction. It consists of a Y-shaped rubber strap moulded to fit the head. The perforated ends fasten on to hooks on a wire ring, which fits loosely over the mount of the mask. Alternatively, the hooks may be permanently incorporated in the mask, if desired.



The makers are Messrs A. Charles King, Ltd., 34, Devonshire-street, London, W.

R. J. Clausen, M.B., B.S. Lond.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF THERAPEUTICS AND PHARMACOLOGY.

A meeting of this Section took place on May 14th with Prof. J. A. Gunn, the President, in the chair. The meeting was devoted to a discussion on the

Action and Use of Ephedrine.

The President said that ephedrine was an alkaloid derived from a plant which had been known to the Chinese 5000 years, having been used by them from ancient times as a circulatory stimulant and as a diaphoretic. The alkaloid was isolated from the plant in 1887, but for a long time little attention was paid to it. Five or six years ago it was found to be very close in chemical structure to adrenalin, the chief difference being the absence in ephedrine of the OH groups. There were six possible varieties of ephedrine, but only three possibles of adrenalin. As isolated from the plant the alkaloid contained 80 per cent. ephedrine and 20 per cent. pseudo-ephedrine. The possible variants probably largely accounted for the varied behaviour reported concerning the drug. In Germany ephedrine had been synthesised and with a mixture of dextrose placed upon the market as ephetonine. Ephedrine was less readily oxidised than adrenalin; it was also less active than the latter, the difference being as much as 1 to 120. Perhaps the fact that ephedrine changed much more slowly in the body than adrenalin accounted for its value being retained when given by mouth. Ephedrine was not readily destroyed by boiling, hence it could be sterilised by this means. In asthmatic patients tolerance to ephedrine was produced more quickly than to adrenalin; the doses of the former must be, for chronic cases, gradually increased; sometimes the effects disappeared altogether. In America ephedrine had been widely used for counteracting the effects of shock, and especially to neutralise the results of operation under spinal anæsthesia. Apparently its records in these respects were quite good. It had also been employed to dilate the pupil of the eye and, in place of cocaine, to contract the blood-vessels in mucous membranes. In connexion with the use of ephedrine headache had been described, also insomnia. Sweating also followed, but apparently only after large doses; indeed this symptom indicated that the dose had been too large. There was need for care with the dosage of ephedrine. Though he was not aware of any deaths from its use there had been cases of serious collapse. Ephedrine was useful for stopping the morphine habit.

Mr. J. H. Thompson said he had been investigating the action of ephedrine on the normal human subject, by means of the sphygmanograph, which permitted of a continuous record of blood pressure. He used the ephedrine hydrochloride as supplied by Burroughs Wellcome and Co., and though his results, so far, were incomplete, the inquiry had disclosed some interesting facts. He had found that a considerable number of people failed to respond to ephedrine, and this failure could not be attributed to inactivity of any of the samples used, nor to the channel of administration. The only abnormality he could detect about those persons was a failure of full development of secondary male characteristics. Before the rise of blood pressure normally occurring after its use he had observed a definite latent period; used subcutaneously or intramuscularly this latent period was two and a half to three minutes, and it was extended to 7 to 10 minutes when the administration was oral. During the latent period there was an initial fall in blood pressure, quite irrespective of the method of administration, and the amount of such fall might be as much as 20 mm. of mercury. A rapid recovery followed, however. The effect of the drug was not so lasting when injected as when given by the mouth, and in the latter case the effect was greatest when taken into an empty stomach. After injection of ephedrine there was at first a well-marked rise in the blood pressure, persisting for seven or eight minutes. There was then a return to the normal blood pressure, this being succeeded by a second rise. Five or six such rises might occur, extending for 60 to 75 minutes after giving ephedrine by the mouth. When ephedrine was given by the intramuscular or the subcutaneous method rises were higher and more frequent. Then, after the series of rises had occurred the blood pressure fell below the normal. In one subject whose normal blood pressure was 125 mm. a dose of 1 c.cm. produced a rise to 155 in two and a half minutes; it lasted for seven minutes and then became normal. A second rise of the same order followed, then a third, not quite so high, and after this the pressure reached the subnormal figure of 109, where it remained for 40 minutes; and as it was only 117 an hour later the recovery to normal was very slow. In this stage some complained of renal pain. These phenomena indicated the need for caution in the administration. Sometimes the rise exhibited a dip or step, such as resulted from stimulation of the splanchnic nerve under anæsthesia. In the human subject, when a dose was repeated, the after-fall was much greater, and sometimes was precipitous.

Mr. Frank Coke spoke of the clinical observations he had made on the effects of this drug, which had been very widely discussed during the last few years in relation to asthma. It now passed under a trade name and was readily procurable over the counter by the public. Whether that was to the good he would not say. The treatment of asthma consisted more in the discovery and neutralisation of what was its cause in the particular individual than in the giving of any special drug; but when appealed to by an asthmatic sufferer in the height of his visitation one was glad to have at hand a drug which would do good. The type of patient for whom he had used ephedrine was the person who had attacks of severe asthma separated by long intervals. These had mostly been a good deal benefited, and the patient had been tided over critical periods. Administration might be thought dangerous, but he had not been in the habit of regarding the asthmatic as necessarily neurotic and likely to acquire the drug habit. One great advantage in using ephedrine was that it did not need to be injected, it could be given by the mouth, and it conferred immunity from asthma for two to three hours, even longer. It relieved contraction of the bronchial muscle, and it seemed to have an extraordinary effect on nasal mucous membrane, reducing its turgescence. Following the use of large doses of ephedrine the symptoms were tremor, palpitation, and (though he had not noted this) insomnia. In the reported case of a patient who took grs. 15 of the drug in 20 days acute cardiac decompensation developed accompanied by marked sweating, tremors, weakness, and palpitation. He had noted that patients who had taken a large dose not only could not micturate, but had no desire to do so; indeed they felt as if the mechanism for the act were absent This seemed to indicate a power of paralysing the bladder as well as the mucous membranes of the bronchioles and the nose. He suggested that the drug be supplied in tablets of gr. ¼.

Dr. John Freeman said he began to use ephedrine for asthmatic cases three years ago, but after a time he gave it up. It seemed to do good at first, but in a definitely less degree if persisted in. He took it up again recently, on hearing good effects attributed to it, but the results in his hands were the same. He tried alternating ephedrine with normal saline, unknown to the patient, a woman, and she was unable to tell the difference.

Dr. J. H. Hannan spoke of his use of ephedrine in gynæcological and obstetric practice. In the obstetric shock usually seen there was always some loss of blood, and as a means of carrying the patient temporarily over this condition he had found the drug of considerable assistance. He gave gr. 1 of it in 8 c.cm. of normal saline. Shock in the newly-born was a condition which, in the past, had been overtreated; artificial respiration did much to extinguish the small spark of life which the infant possessed. When definite shock was to be anticipated after operation he had given ephedrine gr. 1 an hour before the operation. Women at the menopause were strangely sensitive to adrenalin, but they were tolerant of ephedrine. Intramuscular injections of gr. 1 produced no effect on the blood pressure. One patient who took an overdose complained of slight irritation of the bladder, two others spoke of nothing beyond abnormal perspiration. One result of injections of the drug was to induce a feeling of general well-being, a euphoria; he had experienced it himself.

Dr. **Philip Hamill** said he had used adrenalin with success in Stokes-Adams syndrome. He had been watching for a case in which transient attacks occurred, passing from the normal rhythm to complete heart-block, with transient unconsciousness, so that he could try on such a patient the effect of ephedrine. He had found it improved some old people whose constant complaint was of tiredness and who had continual low blood pressure.

Dr. **George Graham** said he found that if people required a great deal of adrenalin ephedrine had no effect on them. In two medical colleagues he saw good effects from ephedrine in hay-fever, the dose taken being gr. 1 twice a day. Dr. Graham considered that ephedrine had a future for hay-fever.

Dr. **E. P. Poulton** related the case of an Austrian doctor who had a bad attack of asthma as soon as he arrived in this country which prostrated him, and who said ephedrine was the only treatment which brought him benefit.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF PATHOLOGY.

At a meeting of this Section on April 19th, when Dr. **T. T. O'Farrell**, the President, was in the chair, a patient with

Spirochætal Empyema

was shown by Dr. **John McGrath**.

He was a farmer, robust in appearance, and was admitted to St. Vincent's Hospital on Feb. 8th. He said he had never been sick in his life until he felt ill on Dec. 23rd, 1928, when his local medical attendant sent him to bed for several days, telling him that he was suffering from influenza. When he was out and about again after Christmas he began to feel progressively weaker.

On admission to hospital the temperature was 101° F., the pulse 80, and the respirations 20 per minute. For the succeeding few days his temperature was normal, but at the end of a week it was 99·5° F. in the evening for four days. On admission there were no physical signs indicative of chest or other trouble; the urine had a slight trace of albumin, but the sediment contained no pus, blood, or casts. On Feb. 16th, however, slight dullness was detected at the base of the left lung. This was needled and a small amount of pus, of a brownish-red colour, was withdrawn.

This pus contained numerous pus cells and moderately numerous spirochætes. No other organisms were seen in the smear preparations, and on culture no growth appeared, either aerobically or anaerobically. The spirochætes found were then non-motile; they stained easily, being Gram-negative; they were 4–10μ long, rather thick, and with two to eight undulations. They resembled *Spirochæta refringens*, but several of them seemed too short and too regularly curved to be of this species. A blood count on Feb. 17th showed: red cells 4,120,000 per c.mm., hæmoglobin 65 per cent., colour-index 0·7, white cells 15,080 per c.mm. The red cells displayed very slight anisocytosis, and of the white cells 70 per cent. were polymorphonuclear leucocytes and 1 per cent. were eosinophiles. Tubercle bacilli could not be found in the sputum, nor could spirochætes, and the Wassermann reaction was negative.

On Feb. 17th two ribs were resected, and several pints of fluid like tomato-soup were evacuated. This fluid gave similar results to the small specimen first examined. A drain was left in. On April 12th the fluid showed on spirochætes, and culturally gave a growth of pneumococcic and a coliform organism. The patient was given injections of novarsenobenzol, and a vaccine was prepared from the last cultures of the fluid. The urine, on April 17th, contained a considerable amount of albumin and several hyaline and some granular casts; but the patient's condition appeared to be good.

Few cases of spirochætal empyema appeared to be recorded, said Dr. McGrath, and especially rare was a case, such as the one described, in which the condition was not associated with gangrene of the lung or the presence of other organisms. A case with coexistent spirochætal empyema and gangrene of the lung had been reported by French observers in May, 1928, but in Dr. McGrath's case he was assured that there was no suggestion of gangrene of the lung. The patient's teeth were in good condition, but showed one small and one moderately large cavity. Since it had been stated that in tropical broncho-pulmonary spirochætosis, *S. castellanii* could nearly always be isolated from bad teeth, smear preparations of scrapings from the patient's teeth cavities were examined. Micro-organisms were present in very large numbers, but spirochætes could not be found.

Reports and Analytical Records.

PILSNER URQUELL BEER.

(Imported and Bottled by Pilsner Urquell and Co., Ltd.
77, St. Thomas's-street, S.E. 1. Brewed by the
Bürgerliches Brauhaus (Citizens Brewery),
Pilsen, Czecho-Slovakia.)

When analysed this beer gave the following results:—

Original gravity (before fermentation) ..	1049·39
Present gravity	1014·02
Alcohol	4·15 per cent.
Acidity (acetic acid)	0·08 „
Colour	5°
Preservatives	Nil

This beer possesses the delicate flavour typical of a matured high-class lager. It is very pale in colour, more lightly hopped than English beers of similar gravity, and is fully fermented.

Extension of the Elizabeth Garrett Anderson Hospital.—Last week the Queen opened the new "Queen Mary's Wing" of this hospital in the Euston-road. The institution dates from 1866, and the foundation-stone of the present building was laid by Queen Alexandra in 1889. The hospital now contains 106 beds with 28 beds at the Rosa Morison House of Recovery. In the new wing there are two surgical and medical wards of 18 beds each, a maternity department, a children's ward, two operating theatres, a new X ray department, and an enlarged out-patients' department with its own operating theatres. Further contemplated extensions are a new nurses' home, a pathological block, an isolation block, and wards for paying patients.

Royal Sussex County Hospital.—The appeal launched in 1920 for funds for the extension of this large hospital at Brighton has been disappointing in its results and the governors are therefore proceeding with their centenary scheme in stages rather than commit the hospital to a burden of debt. Last year the extension of the nurses' home and the lecture room and separate provision for the domestic staff were completed. This year it was decided to provide a new casualty department, but the new development was only made possible by a gift of £10,000 from Mr. Bernhard Baron. The department, which was opened on April 30th by Prince Arthur of Connaught, consists of a surgery, waiting-room, a minor operating theatre, and the accommodation needed for dealing with casualty patients, of whom there were 11,000 last year.

Reviews and Notices of Books.

CONTRIBUTIONS TO PSYCHIATRY, NEUROLOGY, AND SOCIOLOGY.

Dedicated to the late Sir FREDERICK MOTT, K.B.E., Hon. LL.D., M.D., F.R.C.P., F.R.S., by his colleagues, friends, and former pupils. Edited on behalf of the Mott Memorial Committee by J. R. LORD, C.B.E., M.D., F.R.C.P.E. With an appreciation by W. D. HALLIBURTON, M.D., F.R.C.P., F.R.S. London: H. K. Lewis and Co., Ltd. 1929. Pp. 401. 21*s.*

THE purchase of a handsome memorial volume is an act of piety not always rewarded by the acquisition of a solid addition to a library. An enthusiastic response to an invitation may cool in the interval between promise and performance, and contributions keenly anticipated too often take a perfunctory form when delivered. The high level of the original matter supplied by those who have been chosen to pay tribute to the memory of Sir Frederick Mott is thus noteworthy. The Mott Memorial Committee, under whose direction the book was prepared, consists of Sir Hubert Bond, Dr. F. L. Golla, Dr. Douglas Macrae, Dr. Thomas Beaton, and Colonel J. R. Lord, the last-named acting as editor. Reminiscences of some of Mott's many activities and details of his career are set out by Prof. C. von Monakow, of Zurich, and Dr. W. A. Aikin, while Prof. W. D. Halliburton supplies informal notes, giving a charming picture of a man whose happy wit, musical talent, and culinary accomplishments were a continuous source of pleasure to his friends. The articles range from highly technical pronouncements on the histology of the central nervous system in health and disease, and on biochemical changes found in psychotic subjects, to accounts of the development in Great Britain of those facilities for early treatment of mental disorders which the pioneer work of Sir Frederick Mott helped to make available. Contributions have been enlisted from workers in America (F. Petersen and S. E. Jelliffe), Australia (W. S. Dawson), France (G. Roussy and G. Levy), Germany (F. Plaut), Holland (C. U .A. Kappers), Japan (T. Morowoka), Italy (G. Pighini), Sweden (G. H. Monrad-Krohn), and Switzerland (C. von Monakow), as well as from those in the British Isles; among the latter figure appropriately papers from the Central Pathological Laboratory of the London County Mental Hospitals, from the laboratories of the Joint Board of Research for Mental Diseases, Birmingham, and from University College Hospital. Physiology is represented by Sir E. Sharpey-Schafer, anatomy by Prof. G. Elliot Smith. The frontispiece shows a picture of Mott in middle-life, and excellent plates illustrate some of the articles. In a preface the editor writes of the origin of the volume, which is the outcome of a suggestion made by Dr. Golla at a meeting of the Royal Medico-Psychological Association held just after Mott's death. The members will rejoice that the project then outlined has been achieved with signal success, and that a memorial worthy of the teacher and colleague who inspired it has been produced.

A HANDBOOK OF MIDWIFERY.

For Midwives, Maternity Nurses, and Obstetric Dressers. Seventh edition. By COMYNS BERKELEY, M.A., M.C., M.D. Cantab., F.R.C.P. Lond., F.R.C.S. Eng., Obstetric and Gynæcological Surgeon to the Middlesex Hospital. London: Cassell and Co., Ltd. 1929. Pp. 575. 8*s.*

ON every page of this handbook is to be found evidence of the author's vast experience of teaching pupil midwives, not only those who are already trained nurses and therefore better able to understand the principles of midwifery, but also the older untrained women who often find the theoretical side of their work so difficult and exacting. Throughout, the teaching is dogmatic. The midwife is first told how and why some event takes place. She is then told exactly what she herself must do and when to send for medical aid. Lastly, the procedure of the doctor is explained. No doubt many medical men of limited experience have been grateful for the presence of this little book in the midwife's bag.

The extensive revision to which the seventh edition has been subjected has necessitated the omission of the chapters on physiology and the questions and answers founded on the rules of the C.M.B. These, with certain additions, now appear in separate form under the title of "Physiology for Pupil-Midwives."

CLINICAL PATHOLOGY.

The Principles of Clinical Pathology in Practice. By GEOFFREY BOURNE, M.D., M.R.C.P., Casualty Physician, St. Bartholomew's Hospital; and KENNETH STONE, M.D., M.R.C.P., late Senior Demonstrator of Pathology, St. Bartholomew's Hospital. London: Humphrey Milford, Oxford University Press. 1929. Pp. 392. 16*s.*

THE title of this book hardly represents its content. It is, in fact, concerned less with principles than with their application. The authors state that the work is an attempt to "collect what are the most constant clinical pathological findings in disease, to state when the result of a test, whether positive or negative, is of value, and to record when such a test is worth doing and when it is capable of giving help." Such guidance is certainly needed by the practitioner, but the difficulties besetting its provision are not light. With the possible exception of the Wassermann reaction for the diagnosis of syphilis there are no clear-cut "tests" in clinical pathology. The business of the clinical pathologist is to use his laboratory as a means of elucidating the nature of morbid processes. This can only be done by the careful collection of evidence at the bench and by comparison of such evidence with that obtained at the bedside.

Where the pathologist is invited to see the patient in consultation with a physician or surgeon the diagnosis is likely to rest on surer ground than when each does his part of the investigation separately, and the correlation of the results is left to an assessor. But where joint work is not possible a pathologist who has to supply a written report is likely to be guarded sometimes to the extent of describing fully the nature of the material sent him without giving any indication of the significance of any abnormalities noticed or of their relative importance. In order to use such a report the practitioner must know in what terms a report on normal material would be couched and what variations are within normal limits; he must also discriminate, for example, between those changes which are recognised indications of diseased structure, disordered function, or parasitic invasions, and those which are merely signs of unusual formation, idiosyncrasy, or symbiotic association. In this book, written jointly by a clinician and pathologist, a creditable attempt is made to familiarise the practitioner with the sort of reports he may expect to receive and with the range of the deductions to be drawn from them. Unfortunately, it is not arranged on a uniform plan. For example, the section on diseases of the respiratory system very properly begins with a chapter on the significance of various abnormalities in the sputum, and a chapter on the estimation of renal efficiency precedes the discussion of various diseases of the kidney. But in some subsequent chapters the outlook is changed and the description of the pathological findings starts with the assumption that the diagnosis has been made. Similarly, the section on Diseases of the Gastro-Intestinal System is divided into seven chapters, six of which deal with diseases of various parts of the tract and the pathological disturbances characteristic of them. Interpolated among them is an excellent account of the examination of the stools marred only by the omission of a discussion on occult blood, which has been dealt with in a chapter headed Diseases of the Stomach. The authors have not always remembered that the most urgent problem confronting the practitioner is to interpret reports on cases still undiagnosed, and, therefore, impossible to classify

On page 286 the statement that the "commonest discoverable causes" of pure chronic nephrosis "seem to be chronic sepsis, tuberculosis, and syphilis," is not helpful; the cause is not yet discovered, and on page 303 the statement that acute pyelonephritis is a "rare condition in which an acute pyelitis extends from the pelvis into the renal tissue" is hardly in accord with modern views.

For the most part, however, the interpretations offered will be acceptable alike to pathologist and clinician, and Dr. Bourne and Dr. Stone deserve credit for having produced one of the first books in which descriptions of technique are entirely subordinated to explanations of the extent to which pertinent answers to definite questions can be obtained from the laboratory.

TUBERCULOSIS.

Some Methods for the Prevention of Tuberculosis. By W. BOLTON TOMSON, M.D., Medical Superintendent of the "Sea-View" Sanatorium, St. Leonards-on-Sea. London: Baillière, Tindall and Cox. 1929. Pp. 143. 6*s.*

Part I. of Dr. Tomson's book gives an account of the campaign against tuberculosis in France, Belgium, Switzerland, Norway, Sweden, and America. It is so rare for the enthusiast in preventive measures to look beyond the borders of his own country for information that there is good reason for wishing to encourage an author with extra-territorial sympathies; but it must be confessed that the information he has provided us from abroad is very sketchy, and should be described rather as glimpses than as panoramic views. However, as far as France is concerned, his account of the *Œuvre Grancher* and *Placement Familial des Tout-Petits* is complete enough to be interesting. Part II., which represents approximately two-thirds of the whole book, deals with the campaign against tuberculosis in England, and includes an eloquent defence of tuberculosis village settlements, of which the author records his conviction "that no better agent has been devised in this or any other country for combating the disease." Here is a challenge indeed. For it is safe to assume that not one tithe of the vast sums of money which have hitherto been spent on tuberculosis throughout the world have gone into village settlements. The author's claim is bold, perhaps extravagant. But it deserves to be treated seriously for this, among other reasons, that he gives in much detail the arguments which have generated his faith in this measure. He is not even afraid to deal with the weak spots in village settlements—their finances. The book concludes with a most interesting account of antituberculosis work in Hastings, much of the efficiency of which is due to the author.

INDUSTRIAL PSYCHOLOGY.

By Several Authors. Edited by CHARLES S. MYERS, M.D., Sc.D., F.R.S., Director of the National Institute of Industrial Psychology. Home University Library. London: Thornton Butterworth and Co., Ltd. 1929. Pp. 243. 2*s.* 6*d.*

IT would appear that the new science of industrial psychology is carrying on a menage à trois, being indissolubly wedded both to economics and to physiology. The essays that constitute this volume are, with the exception of Prof. Drever's chapter on the human factor, the work of Dr. Myers (who gives an all too brief introduction) and of his colleagues of the National Institute. The aim of industrial psychology is, as the editor states, to discover the best possible conditions in occupational work, whether they relate to the choice of a vocation, the selection of the most suitable workers, the most effective way of avoiding fatigue and boredom, the study and provision of incentives, the causes and remedies for irritation, discontent, and unrest, and the best methods of lighting, ventilation, temperature, lay-out of material, and of organisation. Each of these topics receive detailed treatment at the hands of specialists, and the essays go far to illustrate the liaisons to which we have already referred. This is no reproach, but a testimony to the breadth of the foundations and the height of the aims of this new science of industrial psychology. Such a science is pragmatic in the extreme, and in the interest of human happiness and productiveness takes all knowledge to be its province. The volume lives up to the high reputation of the series.

Practice, Oscillation, and Fatigue. A Study of Work at High Pressure. By J. C. FLUGEL, B.A. Monograph XII., British Journal of Psychology. London: Cambridge University Press. 1928. Pp. 92. 8*s.* 6*d.*

THE object of this research was to set a task of a large amount of easy work to be done with the maximum speed, and from the results obtained to estimate the curves of practice and fatigue and oscillation in the individual and in the group. The curves are related to one another, and the effect of practice, fatigue, and oscillation are measured and compared.

The research is a model of its kind both in lay-out and in conscientiousness of detail and logic. The shortcomings involved in the giving of incentives—in the form of rewards for speed—is realised, and the complexity of the factors involved in oscillation is admitted.

It was found that subjects suffered less from fatigue with the growth of practice, and that those who were the most easily fatigued were the less improvable. With this increase in speed following practice is connected a decrease in subjective fluctuation, as was shown by the diminished oscillation during the latter days of the experiment. Similarly, increase in fatigue involved a greater tendency to fluctuations. It is noteworthy that, when parallel intelligence tests were carried out on the young subjects, the correlation of ability in the experiment with ability in the test proved to be very low.

The monograph calls for careful study by educationists and students of industrial psychology.

THE MEDICAL ANNUAL.

Forty-seventh year. Bristol: John Wright and Sons, Ltd. 1929. Pp. 612. 20*s.*

THE "Medical Annual" stands alone in British medical literature and surpasses most corresponding foreign issues in quantity and quality. It is attractively bound and printed, embellished this year with 71 plates and many other illustrations, and soundly compiled. To any of our readers who may be unfamiliar with the scope and purpose of this book, we may say that it consists of authoritative reviews of progress and literature in all the medical sciences, handily arranged in topical, alphabetical order and interspaced with blocks of bibliographical references. Dr. Carey F. Coombs and Mr. A. Rendle Short are associated as editors, and the panel of contributors includes Prof. John Fraser, Dr. Robert Hutchison, Prof. Hey Groves, Prof. Hugh MacLean, Sir Leonard Rogers, Sir John Thomson-Walker, and Prof. Beckwith Whitehouse, to mention only a few of those whose coöperation has been enlisted. The surveys are comprehensive and impartial and, though mostly concerned with British work, include numerous references to collateral European and American advances. Crisp comments by the contributors and reproductions of many photographs, charts, prescriptions, tables, and diagrams add greatly to the value of the synopses of original articles. It happens, this year, that the preponderance is slightly on the surgical side. The work of H. Lilienthal, A. A. Law, J. R. Coffey, J. L. Yates, and others is discussed with reference to surgery in the treatment of phthisis, empyema, cancer of the lung, and bronchiectasis. This section is well illustrated by photographs and drawings of the stages of thoracoplasty as done by Coffey. A similar composite review deals with the different methods of spinal fixation in tuberculous spondylitis, including the ingenious new technique of S. A Grantham; fractures and injuries of the spine; and Kümmell's disease. A brief discussion of pre- and post-operative measures against shock, embolism, and parotitis continues the series of articles on these topics in previous Annuals. Notes on technique in intestinal surgery are given by the surgical editor. Advances in surgery of vessels are recounted in several parts of the book, notably in the section on periarterial sympathectomy. The articles on stomach and kidney surgery are shorter than the corresponding articles in 1928 and supplementary to them. A general survey of surgery in the East is contributed by Prof. A. Dickson Wright, of Singapore. A useful section is that by Prof. G. Hadfield on the conduct of post-mortems in general practice. This includes detailed technical instructions, a table of post-mortem changes, discussions on special cases of traumatic and sudden death, and a subsection on the medico-legal aspects of pregnancy, abortion, and infanticide. As in previous issues, there are reports of judicial decisions, the workings of the Workmen's Compensation Act, and new facts in industrial medicine. A good account of pulmonary asbestosis is included.

As to general medicine, there is ample justification for the claim that "the volume is full of suggestions as to treatment of everyday diseases." In commenting on new drugs, such as parathormone and ethyl hydrocupreine, the contributors maintain a delicate balance between undue conservatism and a readiness to accept everything new in an uncritical spirit. The sections on bronchitis, anæmia, gonorrhœa, rickets, and pneumonia are especially informative. The fuller reviews concern angina pectoris, the thyroid gland, and encephalitis, among other subjects. Endocrine therapy is fully discussed, and complete notes are supplied of the three ovarian hormones. There is a highly technical article on syphilis and the Kahn test, many interesting sections on ophthalmological work, and a mention of lysozyme. The accounts of modern developments in radium, radiotherapy, and phototherapy appear to be trustworthy and detailed.

In short, the contents of this year's "Medical Annual" are up to standard, and practitioners who have not hitherto made a habit of buying the volume year by year would be well advised to begin now.

A MANUAL OF OTOLOGY.

Eighth edition. By GORHAM BACON, A.B., M.D., F.A.C.S., Consulting Surgeon of the New York Eye and Ear Infirmary; and TRUMAN LAURENCE SAUNDERS, A.B., M.D., F.A.C.S., Aural Surgeon, New York Eye and Ear Infirmary. Philadelphia: Lea and Febiger. 1928. Pp. 576.

THE affections of the ear are clearly described in this book and the discussions of methods of treatment are full, well balanced, and in accordance with generally accepted principles. Numerous illustrative cases are related in the sections on diagnosis and treatment; these are of value in awakening the interest of the student, but may irritate the busy general practitioner in need of a compact book of reference. Some obsolete methods of treatment are included only to be condemned—for example intratympanic operations for chronic catarrhal deafness, such as removal of the stapes and artificial perforation of the membrana tympani. A monometric test for lateral sinus thrombosis is given five pages, a greater space than a new and almost untried method is entitled to occupy. The method depends on the fact that compression of the jugular vein raises the cerebro-spinal pressure as shown by a manometer attached to a lumbar puncture cannula, and that, when the lateral sinus is blocked, this rise of pressure does not occur. The description of the tests of labyrinthine function has been included among the symptoms of suppurative labyrinthitis, whereas it would have been better placed in the chapter on examination of the ear.

The work can be confidently recommended as an excellent text-book.

BLOOD GROUPS.

L'Individualité du Sang. En Biologie, en Clinique et en Médecine Légale. Par LEONE LATTES, Professeur à la Faculté de Médecine de Modène. Paris: Masson et Cie. 1929. Pp. 150. Fr.50.

THIS book represents the first really serious attempt in any language to bring together all the facts known up to the present in regard to the blood groups. Prof. Lattes has ranged the whole of the literature on the subject; no work of importance appears to have escaped him and he has succeeded in bringing together an immense mass of information. This is not one of those works in which the reader is presented with a mass of facts and left to digest them as best he can. Prof. Lattes's own work on the subject renders him a sound and competent judge of values; he has succeeded in binding his material together into a reasoned and well-knit whole. This book is a landmark in its particular field. It has already appeared in German, French, and Italian, and we look forward to the issue of an English translation. Prof. Lattes supports the limitation of the agglutinogens of the blood to the original A and B of von Dungern and Hirschfeld, and his authority, backed by the evidence brought together in this book, should serve to lay the phantoms of the multiple agglutinogens which have hovered over the subject for the last five years. He believes that in postulating these multiple agglutinogens, their originators were led astray by failure to realise the possible variations in titre of both agglutinogen and agglutinin in different bloods of the same groups; to this may be added the impulse irresistible to many, to make simple things complex. Prof. Lattes gives an admirable survey of the hypothesis of Bernstein, and concludes on all the evidence that his view that inheritance of the groups is governed by the presence of the three allelomorphs A, B, and O must replace the hypothesis of von Dungern and Hirschfeld.

The section devoted to the medico-legal application of blood grouping is of particular interest; in this section Prof. Lattes cites much of his own work, including such surprising feats as the grouping of blood from the stain of a squashed flea on clothing and from drops of blood on straw and pebbles. In legal medicine the blood groups have hitherto been considered chiefly as a means of determining non-paternity, but the matter has other applications, and the author points out that in Bavaria, Würtemberg, and Russia it is already laid down by statute that in all cases of "crime sanglant" the blood group of the victim must be determined, at autopsy if necessary, with a view to comparison later with blood stains on the clothing of accused persons.

APPLIED BACTERIOLOGY FOR NURSES.

By JEAN MARTIN WHITE, R.N., Instructor in Sciences, School of Nursing of St. Mark's Hospital, New York City; formerly Visiting Instructor, Schools of Nursing, of Bellevue and Harlem Hospitals, New York City. New York: Macmillan Company. 1928. Pp. 200. 12*s*.

THIS little book is written clearly, attractively, and soundly, and the views expressed are commonsense ones not overloaded with technical details. There is an admirable insistence upon the practical matters of specimen collecting, and upon the liaison between the ward or theatre and the laboratory, which should be taken to heart. Some of the diagrams do not make for the simplicity they are intended to produce, but on the whole the selection of matter has been judiciously made and readably presented.

HE LANCET.

DON: SATURDAY, MAY 18, 1929.

MILITARY MEDICINE.

ifth International Congress of Military and Pharmacy, whose proceedings are in THE LANCET last week and this, came to ion on Saturday last. The Congress was in y a success, and hearty congratulations may l upon this fact to the Director-General of y Medical Services, Sir MATTHEW FELL, alike of the Congress and the main-spring of its . In his inaugural address Sir MATTHEW well the essential objects of the Congress, pointed out that medical services in the rmies, and air forces of a nation were united ommon bond of membership of the medical , and should take full advantage of inter-exchanges of ideas and experiences, directed the care and treatment of the sick and in war. For here each nation, in whatever of alliance or of enmity it may find itself, the identical desire to relieve the misery of batants. Only by organised meetings at e intervals can the results of such ideas and es be considered in their real bearing upon ent organisations set up to deal with the mass of human suffering which war must bring.

nd this it is important to recollect—while ervice, as arranged for national defence or unctions in accordance with the principles ations required by the commands of the ich are served, the congresses of the officers arge these responsibilities must be of great civil medicine and indeed to all the world, will assist in the application of advances in cience to peace conditions. The aim to-day l civilised nations of medical endeavour for urposes makes for the maintenance of the andards of hygiene and sanitation, and while during actual war must be directed almost y to producing the least possible delay in he sick and wounded within the immediate edical care, the general lessons of value to munities receive remarkable illustration So that from the military necessities of a d there springs the permanent development measures for all. The point was well made OYNIHAN when he introduced the name of NIGHTINGALE into his eloquent address at all banquet, for from what that great woman e Crimean War sprang the whole of the rvice as it exists to-day in this country, in ll as in military hospitals. And much of the and intensive research conducted in the es of the belligerent services during the late bearing fruit in civil hospitals and in public ministration; so that it is for the advance- he good of all that the lessons of this work regularly reviewed in the light of progressive nt.

ressions of those who attended the Congress, ientific sessions and its many social diver- went to prove that the labours of the conveners and of the officiate were well repaid in results. First there was a distinct development of international friendship in spite of the difficulty of language, and may not too much be made of this difficulty? Most of the representatives present at the Congress knew some English and some French; most of their hosts knew some French; and in dialogue, at any rate, the advantage could be reaped of a common education along special lines and having a high standard. This ensured that, however imperfect might be the command of each other's language, conversations, though started in a halting manner, would often develop into real intercourse as each found a way to understanding the other. But it must be admitted that the English were usually the slower to take the plunge, the less ready to guess at meanings, and the more self-conscious of their limitations. None the less a real interchange of view was often effected between members of the Congress upon such matters as the standardisation of certain essentials of war equipment, the work which is done here by the various committees of the Red Cross—for example in laying down forms for the recording of casualties—and the regulations in our own army concerning the details of first field dressings, the uniformity of stretcher-fittings, and many analogous matters. No doubt the great difference in our military organisation, as a voluntary and permanent one, including completely separate services for the Army, Navy, and Air Force must have given our foreign guests a great deal to think about, much, we trust, to admire, and something perhaps to criticise; but in one respect criticism was wholly withheld, for of the nursing in our Service hospitals our foreign guests spoke with unbounded admiration, contrasting it with the nursing made possible under a conscription system. That these things should have been discussed by men of experience face to face will produce valuable consequences, and it is to the fine coöperation of our civil medical bodies that the great occasions for such discussions were due last week. We feel that we are speaking in the name of the organisation of the Military Congress when we speak thus of the hospitality extended to the members.

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THERAPEUTIC SPLENECTOMY.

ALMOST the only thing a surgeon can do to the spleen is to remove it, and we may well feel a little surprise that this drastic form of intervention should have found an undisputed place in therapeutics For little is really known of the physiology of the organ and no more of the part it plays in pathology, and the operation was originally undertaken on the crude assumption that in certain diseases the spleen was enlarged, and therefore presumably a diseased structure which the body would be better without. Of late years, however, splenectomy has gradually been assigned a settled rôle in the treatment of one or two conditions whilst leaving considerable excuse for doubt in others. Since the total experience of one person can never be very large, owing to the rarity of splenic disorders, it is useful to pool the knowledge obtained from various sources, and hence a good deal of interest attaches to the recent debate on this subject at the Royal Society of Medicine, reported in our last issue. Dr. HUGH THURSFIELD cleared the ground by making a clear statement of the few undisputed facts of splenic physiology, pointing out that the spleen has been proved to be a reservoir of blood which can be tapped at need; that it certainly plays some part in infections, as it almost always enlarges in their presence; that its removal can be adequately compensated for; and that it is seldom if ever the only representative of splenic tissue in the abdomen, a fact which is of great importance to the surgeon. Beyond this, as he pointed out, little further is known for certain about the uses of the spleen. As for surgical interference with it, the conclusions reached by Mr. A. J. WALTON in the course of his masterly review seem to be those accepted by most physicians and surgeons. Apart from injuries and torsion and the very rare neoplasms for which splenectomy gives brilliant results, the indications for operation are few—not nearly so many, in fact, as we were disposed to think a few years ago. Even these indications are hedged round with conditions which must be observed if success is to be achieved. Cure may, indeed, be brought about in Banti's disease, but only at an early stage when damage to the liver is not far advanced; in purpura hæmorrhagica the bleeding may be stopped, but care must first be taken to make sure of the nature of the case, for if there is thrombocythæmia and not thrombocytopenia the addition (caused by the operation) of more platelets to the excessive number already in the blood may lead to widespread and fatal abdominal thrombosis. The functions of the blood-platelets, to which attention is drawn this week in another column, have here a surgical significance. In acholuric jaundice, again, particularly of the acquired type, very satisfactory results have followed splenectomy; but here the list of successes begins to tail off, for in all the other conditions in which the operation has been tried, reports are conflicting and not as a rule enthusiastic. Amelioration without cure is their general purport, and advocacy of this form of treatment is apt to be rather half-hearted. Certainly splenectomy seems inadvisable in pernicious anæmia, where much more effective medical treatment is available, and in the leukæmias, where enlargement of the spleen is only a part of a general leucocytic disease. In Gaucher's disease, too, the advantages of the operation are very doubtful on similar grounds. Certain cases of chronic sepsis admittedly furnish arguments for the operation, and also early cirrhosis of the liver, which has now become a rare disease, but more experience and further study is needed before a sound judgment on these points can be made. Here the subject must be left for the present. Where indications are precise and action is taken, it must always be remembered that the operation may prove very formidable. The organ lies deep, the supplying vessels are much enlarged and nearly always friable, whilst adhesions are often numerous. Nevertheless surgical handicraft has found fairly satisfactory ways of dealing with the difficulties which arise, whilst the possibility of preliminary or simultaneous transfusion of blood is an important factor making for safety. If splenectomy is required at all, we may say broadly that the earlier it is undertaken the better the chances of success.

THE LONDON RHEUMATISM CLINIC.

THE proposed Clinic for the treatment of rheumatic diseases in London has made good progress and is now likely to be open in the coming autumn. All the money has been collected and building is in full swing in Regent's Park Square East where the Clinic is to provide a working unit of sufficient size to treat a normal average of 400 cases a day. There is no need to set out here what the raw material of this Clinic is to consist of. Both the captains of industry as well as those who represent the interests of the workers are at last conscious of the extent to which rheumatic disease is proving a blight on industry and an intolerable burden on the benefit funds of approved societies. We have in this country given an international lead on the incidence of rheumatic disease and in the search for its origin and causation, but although we have admirable hospitals at our spas and watering-places which can deal with at least 5000 bed-patients annually, there is no clearing-house in the industrial areas to sort out those who need in-patient treatment, no proper clinic for out-patient treatment of those in the early stages of disease who can remain at home, and no place where those who have had the benefit of institutional treatment can receive the continued observation and after-care which will alone ensure results. The London Rheumatism Clinic will be the first example of this type of institution, the first link in the chain of a complete rheumatic service, which has for its further development the arthritis unit and the spa hospital. The physical treatment clinic is not only the first but the most important of the three, for here we have only to regard the position in Holland where there are no spas and where, none the less, multitudes of early cases of rheumatic disability are completely cured in the local clinic at Amsterdam. To the British Committee on Rheumatism is due the inception of this Red Cross Clinic, and the Committee is unanimous in believing that physical treatment, properly given in conjunction with other special methods, is the best prescription for early and chronic rheumatic disorder. Arrangements will be made in the Clinic for treatment by means of at least four groups of physical agents including (1) heat and movement in baths, and local application of water vapour and hot air: (2) manipulation massage and exercises, alone or in combination with heat, by the hand or by douches or whirling water; (3) radiation in the form of heat, light, and ultra-violet rays; (4) electricity in the form of constant, interrupted, and high-frequency current. It is expected that the majority of patients will require a course of four to six weeks comprising ten to fifteen attendances which will enable some 12,000 individuals to pass through the Clinic in the course of the year. Those who are able and willing to pay a reasonable fee for treatment will do so and there is every prospect that the industrial assurance societies, all of whom have coöperated, will contribute. In this way the Clinic itself should be self-supporting or something like it.

Last week the important step was taken of appointing a consulting staff of honorary physicians to attend the Clinic in an honorary capacity; various directors and experts in special forms of treatment are to be appointed later. The decision to staff the Clinic on the lines of a general hospital differs from continental practice in such matters, as may be seen from the appendix to the concluding article on Modern Physical Treatment in Relation to Rheumatism which we publish on another page of this issue. The Amsterdam Institute, for instance, is in charge of a director who is responsible for both the administrative and the clinical sides, and in general this may be said to be the practice of all such special clinics on the Continent or in America. Our own experience of the voluntary hospital system is a peculiarly happy one; its beneficent spirit is much to be desired at such a clinic, and we hope that a combination of this spirit with that of the continental clinic will be workable. The question of a director, in accordance with the Continental pattern, will be a matter for later consideration. Dr. Glover's

Report to the Ministry of Health (A Report on Chronic Arthritis. Ministry of Health Reports on Public Health and Medical Subjects, No. 52) admitted general agreement on the fact that physical treatment is more successful when a combination of methods is employed and that variation of treatment is often desirable. It would hardly be within the physical compass of a part-time consulting staff to effect such an intimate liaison that this combination of methods would be open to each individual patient without expert direction by a whole-time resident. It is not, as a recent correspondent imagined, as though balneology requires no skilled and qualified operators. Experience in the action and uses of baths is hard to come by, and at the present time at all events implies careful *study of continental methods. The position, it may be* hoped, will be otherwise in the future, for the London centre should serve as a training ground for those who wish to qualify for the charge of similar establishments which are certain to be set up in other large centres of population. As yet the practitioner under whose care the patient is at home has not sufficient knowledge at his disposal to prescribe the physical treatment which is needed, and it is to be borne in mind that no patient will be accepted at the Clinic save with the recommendation of a doctor. The organisation of the London Rheumatism Clinic is a turning point in the effective treatment of rheumatic affections in this country and no care could be too great in finding the best method for choosing and training the staff who are to control its destiny.

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PROGNOSIS IN SOLAR DERMATITIS.

In a recent leading article[1] we dealt with a group of cases in which the response to the sun's rays is far in excess of the normal, indicating what is at present known of their nature and causation. It only remains to add that any promise of betterment in solar dermatitis should be guarded. The prognosis is worse the longer the condition has persisted, and the congenital cases with hæmatoporphyrinuria, which presumably depend on some inherited dyscrasia of liver function, are most intractable. The milder cases which develop in early youth are relatively favourable, most of them clearing up after puberty. When the symptoms develop suddenly in girls in their teens the outlook is not too gloomy if the patient can afford a systematic investigation. The urine should be examined—chemically, microscopically, and with the spectroscope—and the physician should not be content with a simple statement that blood, sugar, albumin, and hæmatoporphyrin are absent. Notice should be taken of any abnormal blood pigment, such as methæmoglobin or bilirubin, &c., and of the presence of indican. Intestinal toxæmia may be revealed by high lavage and bacteriological investigation, although it should be borne in mind that pathological organisms found in the gut may have been excreted from a distant source, such as a diseased antrum or a dead tooth. When such obvious foci have been dealt with autogenous vaccine treatment may help. Measures directed to the improvement of intestinal toxæmia, if present, may be successful; if none can be found an attempt may be made to desensitise by empirical means, such as intravenous peptone injections or autohæmatotherapy. Local protection of the skin by lotions or ointments containing ichthyol or quinine, or the specially prepared ultra-zeozon cream, and powder are worthy of trial.

Annotations.

"Ne quid nimis."

SIR CLIFFORD ALLBUTT.

A BRONZE portrait of the late Sir Clifford Allbutt, *to be placed in the Library at the Medical School at* Cambridge, is being unveiled to-day (Saturday) in the presence of Lady Allbutt, the donor of the portrait, and a small number of personal friends. Sir Clifford Allbutt, Regius Professor of Physic in the University of Cambridge, died in 1925 at the ripe age of 88, the acknowledged leader of the medical profession in this country. To an extensive clinical experience he added a deep knowledge of the literature of medicine, and his academic teaching and powers of organisation alike gained for him his high position, while his personal character endeared him to all with whom he came into contact. A permanent memorial to his memory is fittingly placed in the medical school at Cambridge, where, when over 50 years of age, and without any experience as a professor or a college don, he took his place at once in the front of university life.

IMMUNISATION AGAINST DIPHTHERIA.

THE campaign against diphtheria in New York City, after flagging for a time, has been prosecuted with renewed vigour and considerable success during the last few months. This revival of effort is largely due to public health administrative changes and the formation of a Diphtheria Prevention Commission. Parents desiring immunisation for their children are *in many instances now referred to their family* doctor whose coöperation in the scheme is thereby enlisted. The need for a renewal of effort is shown by the rise in prevalence of diphtheria in 1927 after successive years of decline. In 1926 there were 7530 cases and 477 deaths in New York City; in 1927 13,500 cases and 717 deaths, and in 1928 10,770 cases and 642 deaths. The rise in incidence is probably mainly attributable to the existence of nearly a million unprotected children, mostly under the age of five. In order to reach these children of pre-school age the coöperation of the private physician is essential, and every practitioner has been asked to circulate among his patients a joint letter from the Health Department and the County Medical Societies urging the importance of diphtheria prevention. Hitherto there has been some feeling among family doctors that preventive measures instigated by the health authorities tend to trespass on their preserves. On the other hand, the health authorities complain that the family doctor has not hitherto taken his due share in attempts to prevent disease, though his special position affords ample opportunity for such work. The Diphtheria Prevention Commission have therefore arranged for the free supply of toxin-antitoxin to practitioners, and it is estimated that during the first ten weeks of the year nearly 6000 children were immunised by their family doctor. These figures are based on the assumption that all the outfits called for or purchased during the last three months have actually been used. More reliable figures are those showing that complete courses of three injections have actually been performed during the same period on 7220 children by the 48 health department diphtheria prevention stations. The goal aimed at is the immunisation of 2500 children each week in order to secure the inclusion of those under one year, who represent a total of 125,000 births per annum. During the last week reported on, ending *March 16th, through the combined effort* of physicians and public health officers, it is estimated that a total of 2385 children were immunised. By maintaining a similar rate the desired number would be protected in the course of the year, but as we have already observed, the evidence that purchases imply inoculations can only be regarded as reliable if the purchases do not diminish in subsequent months. Hitherto the children inoculated in private practice have been those advised to go to their family doctor by the health commissioners. The Commission now urge that all doctors should familiarise themselves with the technique, and should proceed to immunise all children in their own families, all those under ten in the families under their care, and all diphtheria contacts. If this advice is followed, important data should be forthcoming as to the results of preventive inoculation in a large community. All depends on the continuance of close coöperation between health officer and private practitioner. The lesson should be appreciated in other countries, especially in France, where, as our Paris correspondent noted recently, a special campaign has been set on foot by Mr. Loucheur, the Minister of Hygiene. In this country, in the absence of combined effort by the various public health services and the medical man in close touch with the life of the individual, attempts to control diphtheria have been haphazard and unequal. The disease is preventable and best attacked when, as at present, it is not very prevalent. How far the plan of campaign in New York would be practicable in London only experience could show, but as a start practitioners might be persuaded at least to familiarise themselves with the technique and to make a practice of immunising contacts and young children.

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[1] THE LANCET, April 27th, p. 882.

THE IMMEDIATE PROBLEMS OF MENTAL DEFECT.

WE have already commented upon the report of the Special Committee of the Board of Education and the Board of Control, so far as it has been issued, noting as one of its most significant features the estimate of the number of mental defectives in England and Wales, made by Dr. E. O. Lewis and his assistants in their survey of six selected areas. Part III. of the report, which has been so far withheld, may appear at any moment; its imminence has been noted in the daily press and, inasmuch as it deals with the defective adult, much writing on the question of compulsory sterilisation has resulted. Those who expect to get endorsement in this part of the report of some of the suggestions which have appeared may be disappointed to find it contains nothing startling on the matter of sterilisation, dealing rather with questions of more immediate practical application.

There are grounds for deliberation which are not sufficiently appreciated. A large number of defectives owe their condition to disease or injury between conception and the age of 3 or 4, and their defects are usually held to be non-heritable. Further, the evidence furnished by Dr. Lewis and his collaborators, as well as that in other reports, shows these secondary cases to be scattered throughout the racial elements and social strata of this country. Mongols, whose plight seems to be due to germinal error, are usually sterile, but a smaller group of defects is due to germinal variation and would be heritable. These cases develop more in some family strains than in others, and one responsible observer has noted that in the family groups where these defects occur more successful individuals—winners of scholarships and so on—are also found. But the bulk of the cases which are causing real anxiety are genetically normal; they express the fact that as the conditions of life become more complex, their inferior mental attainments conduce to inefficiency, while it is these failures who tend to mate with similar failures, owing to the absence of mutual criticism. Also these are the persons who have no initiative, and who tend accordingly to be left in the isolated areas of the country in close association with each other, the more adventurous members of the community having gone where wider opportunities offer. This is a picture of a lower cultural level rather than of a pathological condition, and only when the capacities of such individuals are markedly inferior and their will dangerously weaker does the public ask for protection from them. A few of them may fall so low as to be certifiable on the present standards, but to check their multiplication by sterilisation would mean operations more widespread than seems to be generally recognised. It is hard enough to get segregation of defectives under the wise measures already provided, and it would be harder still if it were believed that sterilisation would follow—the process would not be regarded as preventive but rather as punitive.

In short, there is need for further inquiry before the difficult legislation and harsh administration implied by compulsory sterilisation are put in hand. The procedure has many strong claims to support it, but we feel that further investigation is needed before its adoption as a practical policy can be considered. The directions in which inquiry could be made are known, controls could be obtained, and in this way —with no great lapse of time—data would be forthcoming which would make the right policy far more certain.

NEW LIGHT ON SCHIZOPHRENIA.

THE monumental work of Sir Frederick Mott on the pathology of dementia præcox (schizophrenia) furnished evidence of a generalised anatomical degenerative change not only throughout the central nervous system but in the ductless glands, more especially the gonads, suprarenals, and pituitary. But in spite of these well-marked anatomical changes, repeated observations revealed very little obvious difference between the resting functions of the schizophrenic and those of the normal subject. The group of workers who have continued the investigation on the pathology of schizophrenia in the Central Laboratory of the London County Mental Hospitals have sought for evidence of abnormalities of the physiological response to conditions exerting some stress on the organism rather than for some static difference from the normal state. Once this method of investigation was adopted it was found that the schizophrenic physiology showed signs of abnormalities of response in every direction. Isabella Robertson showed that the vasomotor responses to food, drug, and postural stimuli were inverted; S. A. Mann and his co-workers detected abnormalities of the carbohydrate metabolism and a failure to respond to insulin in the presence of ingested glucose; the processes of oxidation as tested by administration of thiosulphates and other chemical methods were found to be deranged. Most of the phenomena observed were explicable on the theory of a disturbance of the acid-base equilibrium in the psychotic organism, and following up this line of thought it was found that there was evidence in the urinary post-prandial and matutinal reactions of a state of the organism resembling very strongly that which obtains in the normal individual during sleep. Since renal tests cast no suspicion on the regulating mechanism of the kidneys, it became probable that the primary disturbance of the acid-base equilibrium was to be sought in dysfunction of the respiratory centre, and it was, in fact, found that the respiratory centre of the schizophrenic resembled that of the normal sleeper in showing a depression of its response to CO_2. In a paper, published on p. 1032 of our present issue, Dr. Marsh presents further evidence of this depression of the respiratory centre in schizophrenia. Investigating a large number of cases he finds that at least 88 per cent. of them show such a depression and (which is equally important), that it seems to be a general symptom of the disease and not merely an expression of the stuporose state characteristic of so many patients. The facts now placed before us mark another step in the unfolding of a definite pathology in one great division of mental disease, though, as Dr. F. L. Golla pointed out to the Section of Psychiatry of the Royal Society of Medicine on Tuesday, it is as yet too early to draw any conclusions about the nexus between these profound biochemical changes and the disorder of conduct. Information is urgently needed concerning the state of the central nervous system with which these disturbances must be in some way connected; still less have we data on which to come to a decision on the possibility of a psychogenic origin for this class of psychosis. Nevertheless, the remissions of the psychosis occasionally associated with acute bodily disorders, and those of more temporary nature which A. S. Loevenhart has been able to achieve either by stimulating pulmonary ventilation by injection of sodium cyanide or with inhalations of Co_2, give some ground for hoping that the symptoms of dementia præcox may ultimately prove in some degree amenable to a therapy based on biochemical considerations.

CHRONIC PULMONARY SUPPURATION.

THORACIC surgery has achieved notable successes in the treatment of localised pulmonary abscesses. When an abscess, situated in the middle or outer zone of the lung, has become isolated by the formation of encircling inflammatory tissue, pneumotomy and drainage may be expected to lead to a cure. Suppuration limited to the lung parenchyma is however exceptional, for the continuity of lung tissue, bronchi, and pleura commonly leads to a wider spread of disease. Once this spread has begun there are no fixed limits to the infected area and a condition aptly described as "rabbit-burrow abscess" results. The sufferings of the patient with this condition are almost unsupportable: constant cough, fœtid breath, the expectoration of large amounts of stinking sputum, attacks of hæmoptysis, and increasing malaise make him willing to submit to any treatment that promises even a slender hope of cure. Pulmonary abscess is usually associated with an infection by spirochætes, and the expectorated pus may contain enormous numbers of these organisms, almost to the exclusion of other types. A case bearing on this fact is reported on p. 1037. The discovery of the spirochæte as the probable infecting agent led to the use of arsenical preparations in the treatment of these cases, but the results have been disappointing, nor has serum therapy been more effective. Where the physician has failed, the surgeon has met with little greater success, for the difficulty he has to face is akin to that of draining a marsh through a single dyke. Pneumotomy and drainage are insufficient, and lobectomy which involves an operative mortality of at least 40 per cent. is almost a method of despair, although Evarts-Graham has somewhat lessened the risk by the use of the cautery. The effectiveness of artificial pneumothorax depends upon securing a complete collapse of the lung, and this is usually impossible to obtain even when the pleura is free from adhesions. Should only partial collapse result, no benefit will accrue and empyema may follow. Phrenicotomy increases the stagnation in the lung without securing adequate compression. Léon-Kindberg and his colleagues think[1] thoracoplasty of value in suppuration of the upper lobe; lipiodol has, however, shown that the basal bronchi do not ungdergo effective collapse after this operation. Bronchoscopy and lavage, as practised by Chevalier Jackson, may render life supportable by periodic cleansing of the affected lung. We must, however, admit that we are at present powerless to heal, and can do but little to lessen the sufferings of the victims of pulmonary suppuration. It should therefore not be forgotten that chronic pulmonary abscess is sometimes the result of previous neglect; the slightest carelessness in operations on the upper airways may have tragic consequences, nor should the risk of lung infection from neglected sepsis in the nasopharynx be forgotten.

THE HEALTH OF THE LITTLE COUNTRY-TOWN.

THE last line of an old jingle which runs: "The devil made the little country-town," is usually interpreted as a reflection on the ethical, rather than the sanitary, standards of small communities. A recent discussion in *Tidsskrift for den Norske Laegeforening* has centred round the country-town, not as a moral sink of iniquity, but as an area in which the close contact of a few hundred or thousand persons is not compensated for, from a sanitary standpoint, by the public health machinery with which large towns are blessed. This discussion arose out of a series of papers by Dr. E. Andersen, in which he showed how much greater was the improvement of late in the public health of towns than that of country districts. His comparison was intended to promote reforms in country districts, and one of his recommendations was the employment of public health nurses who would, by gentle persuasion and infiltration in the home, see that the orders or recommendations of the local health authorities were translated into action. His conclusions as to the relative iniquity of the country in health matters were challenged by a correspondent, Dr. D. Tornöe, who argued that a factor, which conferred an undeservedly sinister reputation on the country, was the inclusion therein of the little country-town. He implied that if only strictly rural districts could be judged on their own merits, they would not be found to be so unhealthy in comparison with the large towns. In answer to this defence of the really pastoral country district, Dr. Andersen produced some interesting statistics in the *Tidsskrift* for April 15th. He showed that in the eight counties with the lowest death-rate (an average of 9·9 per 1000) 25·3 per cent. of the population lived in clusters of houses in the country—the little country-town. On the other hand, in the eight counties with the highest death-rate (an average of 11·9 per 1000) only 16·8 per cent. of the population lived in clusters. These figures do not of course by themselves acquit the little country-town of the accusation of possessing all the vices of a large town and none of the virtues of the country. But they suggest that the little country-town may not after all deserve its lurid reputation.

HYPERNEPHROMATA.

IN all clinical medicine there are no conditions more interesting than those in which the whole appearance and character of the patient are changed, and of these syndromes that associated with an epithelioma of the suprarenal cortex is perhaps the most striking. It is most common in girls, and the bronzing, hirsuties, and alteration of the figure and mentality of the patient towards the masculine type go to form a picture that, once seen, can never be forgotten. But the enthusiasm of the medical man who encounters such a case in his practice is likely to wane very rapidly when he comes to consider treatment. Of the patients under 20 from whom such tumours have been removed only a very small number have survived, and recently yet another case of sudden and unexplained death within two days of what seemed to be a perfectly simple and successful operation has been recorded in France.[1] In this case the tumour was comparatively small so that it could not be palpated, although its presence was suggested by the clinical condition. It was finally located by radiography, after the preliminary induction of a pneumo-peritoneum—a method of diagnosis not very often adopted in this country. No satisfactory explanation of the high mortality in these cases has been put forward. In the one just quoted no autopsy was allowed and the authors of the report fall back on the supposition that death was due to sudden heart failure, though they give no reason why this should have happened. In a number of the reported cases which have come to autopsy it has been noted that the opposite suprarenal gland was poorly developed, and it seems possible that death following removal of the tumour is due to a defect of adrenal secretion or some other disturbance of endocrine balance. Whatever the cause, it is undoubtedly true that the operation, though technically simple, carries an immediate high mortality quite apart from the possibility of there being undetected secondary deposits in other parts of the body, these being highly malignant tumours. It seems well worth while, therefore, to give deep X ray therapy a trial. Favourable results have been recorded in one or two cases in which the tumour has become smaller and the symptoms caused by it have disappeared.

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[1] Léon-Kindberg, M., Delbreil, J., and Lafitte, A.: Archiv. Méd.-Chir. de l'Appareil Resp., 1928, ii., 300.

[1] Langéron, L., Decherf, E., et Danes: Bull. et Mém. de la Soc. Méd. des Hôp. de Paris, April 1st, p. 436.

PSYCHOLOGY OF READING.

THE relation of speech to the written word symbol remains a central meeting point of many studies. It is cognate to the problem of vision, to the neurology of aphasia, and to the practical application of such psychological functions as learning and skill in various economic activities. Even apparently simple investigations, such as that of assessing the merits of different kinds of printers' type, are hampered by our ignorance of the mental processes involved in reading. The Medical Research Council had at one time a committee on the Legibility of Type, and published the results of an experimental study on the subject conducted by Mr. R. L. Pyke.[1] For years workers on the legibility of isolated letters have clamoured for some modification in the shape of certain confusing letters of the alphabet which make for obscurity and inaccuracy. The printed word and letter are so familiar to us in every-day reading, we take in so much by their "configuration" or Gestalt, that we are blind to the waste involved in bad printing, confusing type, and the similarity of certain letters and words. This waste is not merely of time but of mental effort. It was decided, however, by the Medical Research Council that no conclusions of practical value could be anticipated without a deeper knowledge of the psychological factors underlying the power of reading than is at present available. The Committee on the Physiology of Vision, with which the Committee on the Legibility of Type was merged, therefore initiated a series of studies into the mental processes involved in whole words and sentences rather than isolated letters. The first fruits of this extended research are to hand in two detailed preliminary studies, bound together, on Errors in Reading and on the Relation of Meaning to Perception in Reading respectively by Mr. M. D. Vernon and Mr. R. W. Pickford.[2] Mr. Vernon set out to determine how far typographical errors, and especially the mutual substitution of readily confused letters, entered into the reading of various types of material. By means of the tachistoscope types of reading material of ascending order of complexity were exposed to view for short periods of time. The errors made in various groups were studied and tabulated, and the reliability of the subjects were graded carefully by Pearson's ranking method. It was found that the errors were associated with the form of certain individual letters and with the position of letters in the word, and that certain types of substitution also occurred. Other errors were found to be capable of classification into "meaningful" and "mixed and doubtful." These errors occupied a third of the total. In general it was found that where full comprehension of meaning was achieved in reading, few typographical errors occurred. Where, however, meaning was obscure, or the context was not continuous, errors of substitution or replacement took place. Mr. Vernon found, as did O. Messner, that individual differences in perception were capable of grouping into "objective" and "subjective" classes. In perceiving material in which meaning was of little importance, accuracy increased with the perceptual span, but in advance of Messner, Vernon's observation led him to mark off a broad inaccurate type from a narrow inaccurate type—i.e., in reference to the visual perceptual span. Mr. R. W. Pickford arranged three experiments to investigate the relationship between the flow of perceptual processes and the flow of meaning in reading. It was quite obvious from all the admirably arranged experiments that meaning was a very significant matter in all processes of perception, imperception, and errors. In other words, the rôle of memory and of affectivity is a very important one in all errors of speech and of reading—i.e., errors which are not traceable to gross aphasia, fatigue, poor illumination or defective type. These twin researches, therefore, are not only of interest for what they set out to establish, but also for the associated problems. Curiosity is at once aroused by Mr. Pickford's intention to attack the problem from the standpoint of Head's classification of aphasias. The question of the various forms of visual imperception and word-blindness might be profitably investigated by the same tachistoscopic methods. The temperamental factor probably involved in Messner's objective and subjective types, and Vernon's "narrow and broad inaccurates" suggests new lines of research into the psychology of temperament and its effect on accuracy—a matter of some importance to vocational guidance. Neurologists, psychologists, and educationists alike should take note of these interesting approaches to what superficially looks like a dull subject.

AUSTRALIAN SURGEONS IN CONGRESS.

WE have just had a report of the second annual meeting of the Australian College of Surgeons, which was held at Sydney from March 5th to 9th, when there was a large attendance of Fellows from all parts of the Commonwealth. On the morning of the first day demonstrations on anatomy, pathology, obstetrics and gynæcology were given at the University medical school and in the afternoon on surgery at the Royal Alexandra Hospital for Children and the Lewisham Hospital. At the former, Dr. R. B. Wade showed a number of cases of spastic paralysis and Hirschsprung's disease, illustrating the types suitable for ramisection; it is in the latter that the operation so far has given the most satisfactory results. At the Lewisham Hospital Dr. S. H. Harris demonstrated his operation for removing the prostate with complete closure and restitution of the prostatic urethra. Dr. N. D. Royle demonstrated the technique of lumbar ramisection and his new operation for cervical ramisection. On the second day at the Sydney Hospital a demonstration on skeletal traction was given in the fracture ward by Dr. C. E. Corlette, and on the pathology of bone by Dr. Keith Inglis. In the afternoon Sir Alexander MacCormick operated at St. Vincent's Hospital, where a demonstration of deep X ray therapy was given by Dr. B. Harrison. The whole of the third day was taken up at the Royal Prince Alfred hospital, including the new radium clinic and the department of urology. Three evenings were occupied in discussions at the Royal Alexandra Hospital for Children, where Sir George Syme (since deceased) presided. At the first, which was of a purely administrative character, it was decided to leave in abeyance the question of erecting a building for the College at Canberra. The proper allocation of fees between surgeon and assistant was fully discussed and referred to a subcommittee to report next year. The question of higher degrees in surgery also came up. In Australia there is now a great variety of these and an attempt at uniformity is being made throughout the Commonwealth and New Zealand. Admission to the College, following American practice, is by appointment, on the personal recommendation of a number of Fellows, but after 1932 all candidates for election must possess a higher degree in surgery. At the second evening session Dr. Colin MacKenzie showed a series of specimens illustrating the application of the comparative anatomy of the fauna of Australia to everyday surgical problems. These specimens will form the basis of the anatomical collection it is proposed to establish at Canberra. Dr. H. G. Poate opened a discussion on chronic pulmonary suppuration, Dr. Harris showed the technique of prostatectomy on the screen, and Dr. A. J. Trinca read a paper on fat necrosis of the female breast. At the third session, Mr. Julian Smith opened a discussion on the prevention and treatment of cancer and showed the Canti film. Mr. R. Graham Brown, of Brisbane, read a paper on laryngectomy for malignant disease, which led to criticism of the present distribution of radium, and it was proposed to press for a supply available to all large hospitals in Australia.

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[1] M.R.C. Special Report Series, 1926, No. 110. H.M. Stationery Office. 4s.

[2] M.R.C. Special Report Series, 1929, No. 130. H.M. Stationery Office. Pp. 59. 2s.

FŒTAL DEATH AFTER INDUCTION OF LABOUR BY QUININE.

THE induction of labour by medicinal means—usually consisting of a full dose of castor oil followed by quinine in three doses of grs. 10 each at hourly intervals—has proved sufficiently successful, especially at or about term, to have become generally recognised. Its merit is that no internal manipulation is required and thus no increased risk of infection. With its widespread adoption, however, occasional cases have been recorded of intra-uterine death of the fœtus attributed to the toxic effects of quinine. On p. 1058 we briefly report a preliminary communication made to the British Congress of Obstetrics and Gynæcology by Prof. W. J. Dilling and Dr. A. A. Gemmell, of Liverpool, reviewing 765 cases in which quinine was used for the induction of labour. Among them were eight cases of stillbirth which might have been due to quinine. Judging from the rate of excretion of the drug in the urine of the mother, the maximal concentration in her tissues was six to eight hours after the last dose; but a high concentration may persist for as long as 36 hours. The authors had not been able to demonstrate quinine experimentally in the fœtal tissues after administration to pregnant rabbits, or indeed in the liver and kidneys of stillborn human fœtuses born within 24 hours of the last dose to the mother. Small quantities were, however, found in the urine of infants born 6 to 12 hours after the last dose, and in the liquor amnii, and further investigation is in progress to work out the toxicity and effects of quinine on the fœtal tissues. Major S. A. McSwiney,[1] of the Eden Hospital, Calcutta, recently recorded a case of intra-uterine death and one of death of an infant 21 hours after birth, both following induction by quinine on grounds of post-maturity. In the first case the fœtal heart sounds were lost within nine hours of the last dose and before rupture of the membranes, a stillbirth following a labour of 7½ hours' duration. In the second case the child was born, deeply cyanosed, after four hours' labour and five minutes after rupture of the membranes, and died without convulsions or twitching. There was no post-mortem examination, and death is ascribed to intracranial hæmorrhage.

Torleif Torland[2] mentions other cases occurring in America, and gives two examples from his own practice of maternal idiosyncrasy to quinine, in both of which œdema and a dark purplish skin eruption were produced as well as other troublesome effects. In one, labour did not start for a week and the child when born was normal. In the other, labour began a few hours after the administration of quinine, the fœtal heart sounds being then inaudible. Sixteen hours after the giving of quinine a stillborn fœtus of 8½ lb. was delivered. On post-mortem examination blood was found in the pericardial, peritoneal, and both pleural sacs, and histologically the kidney exhibited an acute tubular and glomerular nephritis.

These cases, and others previously recorded, show that quinine in the doses commonly used for the induction of labour involves a risk of toxic effects to mother and fœtus, and to the fœtus even of death in utero. Cessation of the fœtal heart sounds is so often noted before labour, or early in labour before rupture of the membranes, that the toxic effect of the drug on the fœtal tissues would appear to be a more probable explanation than any indirect action of exciting strong uterine contraction or otherwise disturbing the physiology of labour. McSwiney's assumption of death from intracranial hæmorrhage is scarcely warranted, in the absence of post-mortem examination, in a case where the infant was born naturally five minutes after rupture of the membranes. Possibly, as suggested by Torland, there is another factor in a special susceptibility of the mother to quinine. In a discussion on the effect of the drug when given to malarious pregnant women, P. A. Maplestone[3] takes the view that in therapeutic doses it has no effect in terminating pregnancy and has rather the opposite tendency by curing the malaria which is the real cause of abortion in such cases. References are given to other papers on this aspect, and among the cases quoted are some in which unduly large doses were taken without effect on mother or child.

The subject is one that clearly calls for attention, and the further investigations of Drs. Dilling and Gemmell will be awaited with interest. Meantime it is important that the possible danger to the fœtus should be widely recognised and that cases of fœtal death after induction of labour by quinine, for which no other explanation is forthcoming, should be carefully investigated and recorded.

WE regret to record the death of Mr. Arthur Henry Cheatle, aural surgeon to King's College Hospital, on May 11th, in his sixty-third year.

THE next session of the General Medical Council will commence at 2 P.M. on Tuesday, May 28th, when Sir Donald MacAlister, the President, will take the chair and give an address. The Council will continue to sit from day to day until the termination of their business.

Prof. Henry Roy Dean, F.R.C.P., has been elected Master of Trinity Hall, Cambridge, as from June 17th. Dr. Dean, who has been Professor of Pathology in the University of Cambridge since 1922, was educated at Magdalen College, Oxford, and St. Thomas's Hospital, and formerly occupied the chairs of pathology at Sheffield and Manchester.

DONATIONS AND BEQUESTS.—Mr. Abel Chapman, of Houxty, Wark-upon-Tyne, Northumberland, left £5000 each to the Royal Victoria Hospital, Newcastle-upon-Tyne, and the Sunderland Royal Infirmary.—Mr. Robert Clyde Henderson, of West Park-road, Dundee, left £1200 to the Dundee Royal Infirmary to endow a cot to be named "John and R. C. Henderson Cot," and, after other bequests, the residue of the property to the University College, Dundee, for the foundation of bursaries.—Mr. Christopher Richard Jones, of Woodside Park, London, left £500 to the Finchley Memorial Hospital, £250 each to the Royal Northern Hospital and the London Hospital, and £100 each to the Napsbury Mental Hospital, near St. Albans, and Dr. Barnardo's Homes.—Mrs. Elizabeth Knox Ferguson, of Ardgare, Cambuslang, left £1250 to Glasgow Royal Infirmary; £500 each to the Royal Hospital for Sick Children, Glasgow, and the Association for the Relief of Incurables, Broomhill Home, Kirkintilloch, and £300 each to the Western Infirmary, Glasgow, Glasgow Ear, Nose and Throat Hospital, the Victoria Infirmary, and the Royal Cancer Hospital, Glasgow.

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[1] Jour. Obst. and Gyn. Brit. Emp., 1929, xxxvi., 90.

[2] Jour. Amer. Med. Assoc., 1928, xc., 1190.

[3] Med. Jour. of Australia, 1927, i., 420.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XXXI.—THE CLINICAL SIGNIFICANCE OF THE BLOOD-PLATELETS.

PART II.*

EVEN in the present imperfect state of our knowledge it is possible to make a provisional classification of the pathological conditions associated with a diminution in the platelet count. One can distinguish between those conditions in which a thrombocytopenia occurs as a primary condition and those in which it is a secondary phenomenon. Both primary and secondary thrombocytopenias are accompanied by a tendency to purpuric hæmorrhages.

Primary Thrombocytopenias.

These are held to arise as the result either of diminished production of platelets as in diseases of the bone-marrow, or of an increased destruction of platelets by the spleen and so are associated with certain diseases of that organ. The number of platelets falls frequently below 100,000 per c.mm. and may even fall below 10,000.

To the first-named group belong the thrombocytopenias of pernicious anæmia, of aplastic anæmia, and of the leukæmias; while the second group comprises the thrombocytopenias accompanying splenomegalic conditions (Gaucher's disease and Banti's disease). These various conditions are distinguished by the changes in the other cellular elements of the blood. There is also a condition in which the thrombocytopenia is the only outstanding and diagnostic feature unaccompanied by changes in the other cellular elements of the blood, except secondary changes, due to the purpuric hæmorrhages. This is the condition of "thrombocytopenic purpura" or "essential thrombocytopenia" (Frank). This condition is held by some observers to be due always to the increased destruction of platelets by the spleen, which is usually enlarged, and has therefore been called by Kaznelson "thrombolytic purpura." In this condition splenectomy is often but not always followed by a cure. Even when splenectomy does not produce a permanent cure, it brings about a temporary improvement. In order to account for this, it has been suggested that in this latter type of case there is, in addition to the increased destruction of platelets by the spleen, also a diminished formation by the bone-marrow.

A few points concerning the thrombocytopenias associated with blood diseases are of interest.

A persistent diminution in the number of platelets always accompanies pernicious anæmia. Even during temporary remissions of the disease the platelets remain below the normal number although they show a temporary increase, so that a platelet count may be of diagnostic value. No observations appear to be on record how this thrombocytopenia reacts under liver treatment. Since it appears to be an essential part of the disease it is likely to disappear with the recovery from the disease under this treatment. If that is so, it would be of importance to investigate the effect of liver treatment in other conditions associated with a thrombocytopenia. The platelets are said to be normal in number in secondary anæmias, in chlorosis to be increased.

A thrombocytopenia has been observed by Rosenthal in both the myeloid and the lymphatic types of leukæmia. A few cases of myeloid leukæmia have been reported, however, in which there was either no change or an increase. It has been suggested that a thrombocytopenia occurs in those forms of leukæmia in which the bone-marrow is aplastic, while those in which there is an increased activity of the bone-marrow exhibit a thrombocytosis. The subject requires further investigation, which would throw light on the question of the origin of the platelets.

Secondary Thrombocytopenia.

The most important group of conditions in which the platelets show a marked diminution as a secondary effect are the acute infections, which will be treated under a separate heading. In addition, secondary thrombocytopenias have been found to occur as an immediate effect after the injection of certain drugs such as salvarsan, neoarsphenamin, of colloidal metals, and of protein, peptone, and heterologous serum.

In the case of some of the drugs and colloids, the immediate thrombocytopenia has been shown to be followed during the next few days after the injection by a rise to, or above the normal number of platelets, as a compensatory reaction. A prolonged increase in the number of platelets has been produced as a late effect by the repeated injection of such colloids as indian ink and trypan blue. This effect has been ascribed to a "blocking of the reticulo-endothelial system," but it may possibly have to be interpreted as a summation of such a compensatory effect.

When, as in the case of serum, a previous injection sensitises the organism to a subsequent injection, as in the case of heterologous serum, the thrombopenia after the second injection is intensified (anaphylactic shock). This condition is held to be due to an agglutination of the platelets by the injected material. The agglutinated platelets collect as stated above in the capillaries of the internal viscera—e.g., liver. No observations appear to have been made on the behaviour of the platelets in allergic conditions such as asthma which are held to be closely related to anaphylactic phenomena.

Platelets in Acute Infections.

In many acute infections—influenza, typhoid, endocarditis, diphtheria, scarlet fever, pneumonia—a thrombopenia at the onset of the infection has been demonstrated. This persists during the active stage of infection and is followed by a rise above the normal when the infection subsides. A very striking illustration of this phenomenon was found accidentally by one of us (R. G. B.) in a subject on whom platelet counts were being made everyday, and who developed a cold in the course of these observations.

In lobar pneumonia the number of platelets begins to diminish after the infection has been established. Immediately following the onset of the crisis the platelets begin to increase in number. This continues for several days until the normal number is greatly exceeded and is then followed by a return to the normal after about two weeks. Sequelæ following pneumonia are accompanied by a renewed diminution.

Platelets in Chronic Infections (Tuberculosis).

In pulmonary and surgical tuberculosis the blood-platelet count tends to be high and there appears to be a relation between their number and the severity of the disease. The count may be normal in a mild case, in which the disease, even if extensive, is causing little systemic disturbance. But in cases having a platelet count of 500,000–1,000,000 per c.mm., the prognostic outlook is bad. The platelet count is thus of some value in assessing the physical condition of a tuberculous patient, and may give valuable assistance in assessing the condition of a patient independent of data derived from physical signs, temperature, &c.

There is as yet insufficient information concerning platelet counts in other chronic infective diseases, and the subject is one demanding further study.

Heliotherapy and Platelets.

The stimulating effect of light on platelets in conditions associated with a thrombocytosis has not yet received a clinical application. Cases of purpura are stated to have been treated successfully with ultra-violet light. It is generally assumed that the effect of light can be replaced by the administration of irradiated ergosterol. Although this is the case for the treatment of rickets, it does not follow that it is generally true. A comparison of the effects of ultra-violet light and of irradiated ergosterol on the platelets in the various conditions associated with a thrombopenia remains to be carried out.

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* Part I. appeared last week.

Operation and Trauma.

Surgical operations are followed by a rise in the platelets which begins at the sixth day, reaches a maximum at about the tenth day, and falls again to reach the normal in about three weeks. The same effect has been observed in fractures, but only a few cases were examined. Local sepsis is not a factor responsible for this effect.

Clinical Relationship of the Blood-platelets, Blood-coagulation, and Thrombosis.

The statements on this relationship recorded in the literature are contradictory. The statement is frequently found that in conditions with a diminished platelet count the coagulation time is normal. Most observations on the coagulation time of the blood in disease are, however, of little value, because they were made with unreliable methods. Addis has laid down the following four postulates for the conditions essential for an accurate estimation of the coagulation time by any method :—

1. The blood must be obtained under the same conditions in each experiment.
2. Its contact with a foreign body must be of the same amount and kind for each observation.
3. The end-point must be clear and definite and must indicate the same degree of coagulation.
4. All estimations must be made at the same temperature.

An important factor which has often been overlooked is indicated in the first postulate. The coagulation time may show considerable differences according to the method used in obtaining the blood (venepuncture or by pricking the finger). *The last postulate has been neglected in almost* all clinical observations on the coagulation time.

In normal persons the coagulation time if determined by a reliable method at 37–38° C. is 1 min. 45 sec. It varies so little that a change of more than 30 seconds must be considered to be significant, provided the estimations are made at the same temperature. At 20° C. the coagulation time is 5 min. 30 sec. ; at 18° C. it is 7 min. 30 sec.

It is obvious that for clinical purposes the method must be sufficiently simple to be applied at the bedside. One method which fulfils all these conditions is that of H. H. Dale and P. P. Laidlaw in which the observations can be carried out at a constant temperature. It is then found that the coagulation time is shortened when the number of platelets is raised ; it is lengthened when the platelets are diminished in number. This relationship is in agreement with the known facts concerning the part played by the platelets in blood coagulation as discussed in the first part of this paper.

It has been suggested recently that a relationship exists between the number of platelets and thrombosis. The tendency to thrombosis is increased when the platelets are increased in number. This would account for the thrombosis occurring as an after-effect of the intravenous injection of certain colloids, in the convalescence from infections, such as typhoid fever, and after operations. But since thrombosis occurs only in a small percentage of these conditions in which there is an increased number of platelets there must be additional factors determining the onset of a thrombosis which manifests itself by clinical signs. Of the possible factors which have been suggested may be mentioned : a sluggish flow of blood in the veins of the leg, which are the most frequent site of thrombosis ; local pathological changes in the endothelium ; the increase of fibrinogen, which occur after operative procedures.

The Hæmorrhagic Diathesis and Platelets.

Conditions in which the number of platelets is diminished show a tendency to spontaneous hæmorrhage.

It has, however, been found experimentally that a thrombopenia is not in itself sufficient to cause hæmorrhages, nor is a slight damage to the endothelial wall of the blood-vessels, while the two combined produce an experimental purpura. On the other hand, there are some purpuric conditions such as scurvy and Schoenlein-Henoch's purpura, in which the number of the platelets is normal or only slightly subnormal, and in which, therefore, the hæmorrhagic diathesis must be referred entirely to changes in the vessel wall. Most clinicians who have studied the subject agree that two ætiologically different types of purpura exist, which can be distinguished by the behaviour of the platelets.

According to the accepted view splenectomy is of value only in the hæmorrhagic conditions associated with a low platelet count.

Hæmophilia.—An entirely separate condition is that of hæmophilia, in which there are no spontaneous hæmorrhages, *but in which the coagulation time of* the blood is enormously prolonged. In hæmophilia the blood-platelets are not diminished in number. Numerous observations on the chemical composition of the blood plasma have failed to reveal any difference which would account for the greatly diminished coagulability of the blood. According to some observers the platelets differ from normal platelets in having lost their tendency to disintegrate when coming in contact with water wettable surfaces.

In all hæmorrhagic conditions a platelet count is indicated as a measure of differential diagnosis.

The question whether purpuric conditions present a contra-indication to operative procedures cannot be readily answered, probably owing to the great ætiological diversity of these conditions. Several observers have seen patients with purpura stand major operations and have reported cases of uncomplicated labour. Rosenthal, on the other hand, records two cases of purpura in which exsanguinating hæmorrhages have followed tonsillectomy and childbirth, and which required numerous transfusions to keep them alive.

Bleeding Time.

Bleeding time is the length of time during which a punctured wound, such as is made for blood examination, continues to bleed. Gross variations in the bleeding time are readily noticed by inspection. For purposes of comparison, the bleeding time is determined by making a puncture in the lobe of the ear and applying every 30 seconds a piece of blotting paper to the drop of blood which forms, without touching the skin.

The factors determining bleeding time are obviously more complex than those which determine coagulation time. The temperature of the skin and of the room are not controlled ; the contact with the tissues of the wound which may or may not influence the process, and the conditions and behaviour of the blood-vessels from which the blood passes out, enter as additional factors. The latter is likely to be influenced by the vaso-constrictor substance liberated by disintegrating platelets.

In a normal person the bleeding time is from 1 to 3 minutes. it is greatly delayed in such conditions as purpura hæmorrhagica and pernicious anæmia, when the number of platelets is diminished ; but the bleeding time is not *always prolonged when there is a thrombopenia, and it may* be prolonged when there is no thrombopenia. Roskam has recorded a case of purpura hæmorrhagica where the bleeding time was normal in the left ear but greatly delayed in the right ear. If future observations show that such a condition is at all frequent, it is obvious that bleeding time would be of little diagnostic value.

The statement that bleeding time may be greatly delayed in patients who show a normal coagulation time may be erroneous in view of the fact stated above that most observations on coagulation time have been carried out by defective methods.

Clot Retraction.

This is diminished when the number of platelets is diminished. It is not of sufficient importance to justify a separate vein puncture. Evans has pointed out that information on this point can be gained by washing out with water the capillary tube in which the coagulation time has been determined by Dale and Laidlaw's method immediately after the clot has formed. With a low platelet count the entire soft clot can be washed out ; with a normal or a high platelet count some part of the clot remains adherent to the sides of the tube.

Changes in Morphology and Functional Activity of the Platelets.

In conditions in which there is a great diminution in the number of platelets variations in size have been observed, such as the appearance of abnormally large platelets. Such changes can best be studied in stained blood films, but too little is known as yet to make a discussion of this point profitable from a clinical point of view.

The facility with which the platelets disintegrate when in contact with a water wettable surface may also undergo variation; as already stated the condition of hæmophilia is now held to be due to an impairment of this function. Such variations may be due to inherent differences in the platelets, or they may be the result of chemical abnormalities in the plasma. Since, as already stated, the reaction of the platelets to water wettable surfaces depends on the presence of calcium ions in the plasma, there may be other chemical factors in the environment of the platelets which influence their facility to disintegrate. A method for studying the functional activity of platelets has yet to be worked out.

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W. CRAMER, Ph.D., D.Sc., M.R.C.S.,
Imperial Cancer Research Fund.

R. G. BANNERMAN, M.D., Ch.B.,
Pathologist, Miller General Hospital, London.

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Special Articles.

MODERN PHYSICAL TREATMENT IN RELATION TO RHEUMATISM.

BY R. FORTESCUE FOX, M.D., F.R.C.P.,
PRESIDENT OF THE LIGUE INTERNATIONALE CONTRE LE RHEUMATISME.

III.*—ARTIFICIAL CLIMATES.

THE geographical distribution of tropical diseases or those that are especially prevalent in northern climates clearly shows that external physical conditions, such as temperature, humidity, wind, are favourable or may even be necessary for their development. It is known that many acute diseases are limited to regions having a climate in which particular parasitic organisms can flourish.

Rheumatic diseases of all kinds and many kinds of catarrh appear to be especially prevalent in northern countries. They are more chronic and less febrile than tropical diseases. It is not unreasonable to connect their prevalence with the direct or indirect influence of external cold, just as tropical diseases are connected with external heat.

How much part may be played in the causation of these diseases by predisposition, induced by external heat or cold and other physical agencies, and how much by micro-organisms or other parasites developed and activated by the same physical agencies is not yet determined. It is, however, certain that the diseases prevalent in northern as in tropical climates only affect predisposed persons; only certain persons exposed to cold and damp develop rheumatic symptoms.

Rheumatic persons are peculiarly sensitive to atmospheric changes. A medical man, living near Edinburgh and subject to attacks of rheumatism, always experienced aches and pains if he walked across the meadows when covered by a ground fog. It is often noticed that sufferers from muscular stiffness and pain lose these symptoms when the weather becomes dry and sunny. In addition to the climatic factor microbial infection has been shown to be an important factor in some cases both of articular and of non-articular rheumatism. Many rheumatic persons are liable to local foci of infection which require local treatment. But it is well to remember that where one weed has grown before another may grow again. It is preferable to remove a rheumatic liability than an expression of it.[9]

The above considerations afford a priori grounds for the use of heat and other physical remedies in many forms of rheumatism, so employed as to counteract if possible the influence of rheumatic climates. It has been already shown that an artificial climate can be readily devised which can overcome the abnormal reactions produced, for example, by cold and damp.

The northern nations have had recourse to artificial climates from remote times, for such are their periodical intensely hot vapour baths, in which moist heat is combined with friction and switching. Recent writers confirm the old opinion that these baths are a valuable preventive of disease and fortify the resistance of the body to cold.[10] Periodical heat and mechanical stimulation form the basis of the Roman and Turkish baths. When light is added it is possible to bring the tropics into any country. The good health of the attendants in such establish-

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[10] Same author: Principles and Practice of Medical Hydrology, London, 1913; Kajava, Y.: Arch. Med. Hydrology, 1928, vi., 110.

nents shows that no ill-effects are produced in lwellers in cold climates by spending a large part of he day in a warm atmosphere.

There seems good reason to believe that artificial limates, in which radiation, temperature, and numidity can be varied at will, may become of great alue during periods of acute illness, from their edative and gently stimulating effects. In many orms of more chronic illness daily exposures to rtificial climates of a stimulating character are ndicated. They are especially indicated for the rigo-sensitive subjects of incipient and chronic heumatic disease, provided they are precisely dapted and dosed according to individual requirements.

A suitable course of physical treatment offers to he rheumatic sufferer a change of climate, in brief epeated doses spread over a period of weeks. The umulative impressions of heat, for example, may ffect the condition of the rheumatic subject in nany ways. *There is reason to believe that external* eat, like the internal heat of fever, may stimulate he defensive mechanism of the body. Heat, properly pplied, may increase or modify metabolism, partly, s many hold, through the endocrine system; it may promote absorption, restore a defective action of the kin, and stimulate elimination. In addition to these eneral effects applications of heat appear to have local intensive action on slow and chronic or ubacute inflammatory changes. It is often noticed hat rheumatic joints or muscles become painful and ender under treatment by hot baths and applications, rom the effect of hyperæmia upon rheumatic foci. Thus hot baths may induce both local and general reactions in cases of arthritis, somewhat analogous to those set up by protein shock.[11] At spas where large numbers of cases of articular diseases are congregated, it is a common observation that arthritis and non-articular rheumatism and gout sometimes "flare up" after certain kinds of baths. *Great care is necessary* in these cases to avoid producing too strong a reaction. This has led some authorities to recommend that the physical treatment of all serious forms of arthritis should be so regulated as to give only minimal intensive reactions. Strong reactions which are often set up when baths are combined with manipulation are especially to be avoided because they signify an aggravation of the disease and sometimes extension to other joints. For the same reason, great care is needed in the use of intensive or stimulating baths in arthritis with an active focus of infection. Similarly, such baths should never be employed concurrently with surgical treatment or with the use of protein shock or vaccines, nor yet in cases showing any degree of pyrexia. On the other hand, a purely sedative physical treatment is always safe and often beneficial. It has been observed that in cases with defective resistance a suitable course of baths or physical treatment may even increase an impaired resistance in the body and so enable a focus to be safely removed.

Modes of Action.

The action of physical treatment in rheumatic conditions may be summarised as follows:—

1. *Local action on the skin, diaphoresis.*—In many persons so affected the peripheral circulation is contracted and the skin is cold, harsh, and inactive. Under carefully graduated thermal treatment the condition of the skin and the rheumatic symptoms often show simultaneous improvement. Gentle and increasing and long-continued diaphoresis is, perhaps, the chief indication in the physical treatment of chronic rheumatism. Perspiration begins in the bath but is kept up and often greatly increased when the patient lies down in his hot wraps in a warm room. This general thermal stimulation and increased elimination by the skin undoubtedly facilitate the more local action of the bath.

2. *Production of hyperæmia* in affected joints or other tissues, so as to temporarily intensify inflammation. The intensive local action of thermal baths and applications upon chronic and subacute diseases is also a most important part of the physical treatment of rheumatism. The corresponding reactions vary widely in individual cases, but as has been already stated, the best results are usually obtained from minimal local reactions. The methods employed should be intensive in proportion to the chronicity of the disease.[12] The intensive local action of hyperthermal baths and of mud packs is made tolerable by the general stimulation and abundant diaphoresis they produce.

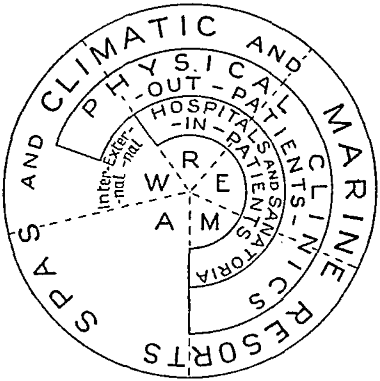

Diagram illustrating physical treatment, being the application of heat and cold and other forms of energy. A = air (climatotherapy); W = water (hydrotherapy, thalassotherapy); R = radiation (radiotherapy, heliotherapy); E = electricity (electrotherapy); M = movement (kinesitherapy).

3. *Nervous factor.*—Warmth, especially in water or vapour, is powerfully sedative. By appropriate baths pain is allayed and muscular tension and spasm are removed. For this reason it is generally easier to carry out manipulation of the muscles or passive movement of rheumatic joints either after preliminary treatment with moist heat, or whilst the limb is still immersed in still or moving water at a sufficiently high temperature. Whilst moist heat is nearly always sedative, dry heat by radiation or hot air is more stimulant. Both heat and cold, especially when accompanied by percussion as in the douche, are powerfully stimulant to the nerve centres.

4. *Resolution of exudations and deposits.*—The intensifying effect of physical treatment on sluggish inflammatory processes brings about in favourable cases, after a more acute phase, an increased tendency to resolution. If the application is too severe the inflammatory reaction is excessive and resolution is *hindered rather than helped. In the treatment of* rheumatic exudation this is especially liable to occur from inappropriate manipulation (massage). But when gentle manipulation is combined with moist heat, as in the whirlpool bath, the resolution of local deposits is favoured by general stimulation of circulation and of elimination.

Particular waters, such as sulphur waters, and certain natural thermal baths are considered with good reason to have a selective action and to increase the resorption of rheumatic deposits.[13] *It is believed*

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[11] Strasser, A.: Arch. Med. Hydrology, 1925, iii., 34; Schmidt, L.: Ibid., p. 38.

[12] Laqueur: Loc. cit.

[13] Fox: Outlines of Medical Hydrology, London, 1924, p. 30.

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The diagram is intended to exhibit the several factors which are included in the scope of modern physical treatment and the place which such treatment may reasonably hold in the hospitals, clinics, and health resorts of the country.

In one word, we may say that there is evidence that the living machinery of the body is deranged by external physical agents, by internal chemical agents, and by bacterial poisons. The external physical agents by their action on the metabolism of the body derange it and chemical poisons are produced. The existing knowledge of these poisons is small, and the physician must trust to the tendency of the body to recover. This tendency can be helped by heat, light, waters, electricity, movement, and rest; and the hypotheses which account for the action of these physical remedies are reasonable.

CLINICS OR SPECIAL DEPARTMENTS (HOSPITAL) FOR RHEUMATISM.

—	Clinic.	Medical staff and duties.	Specialist services and laboratory.	Cases treated.	Beds.
1	*Amsterdam.*—Institute for Physical Treatment (private).	Director (administrative and clinical), *assistant, radiologist (visiting), laboratory technician.	—	Chronic rheumatism; a few other medical diseases and traumatic cases.	—
2	*Antwerp.*—Lander Inst. (private).	Director (admin. and clin.), assistant (treatment and lab.).	—	Rheum., orthopædic, traumatic.	14
3	*Brussels.*—Brugman Hosp. (Municipal), Phys. Treatment Dept. and Rheum. Centre.	Director (clin. and admin.), *assistant, medical students (2).	Assistant for lab. in Dept. Hosp. Services.	Chronic, rheum., medical, gynæcological, traumatic.	A.h.
4	*Aachen.*—Landesbad Hosp.	Director (clin. and admin.), *assistants (5).	Radiologist (one of the 5 assistants), pathologist with technicians.	Chronic rheum., heart dis., metabolic and gastric dis.	316
5	*Berlin.*—City Clinic.	Director (admin.), director (med.), *assistants (2).	Services of city clinics, radiologist (med. director), pathologist and technicians.	All dis. requiring phys. treatment.	—
6	*Berlin.*—University Hosp., Surg. Sect., Rheum. Clinic.	Director (chief assistant to prof. supervisory), *assistants (3), clin. and research.	Services of hospital.	Arthritis chiefly.	A.h.
7	*Vienna.*—General Hosp., Univ. Clinic No. 1.	Director sees all cases, *assistant, clin. assistants (3 or 4).	Services of clinic.	Chronic rheum., some other med. dis.	A.c.
8	*Vienna.* — Jubilaumspital (Mun. Hosp.) Phys. Treatment Dept.	Director (supervisory), *assistant.	Services of hospital.	Chronic rheum., some med. and traumatic.	A.h.
9	*Budapest.*—Red Cross Hosp. Phys. Treatment Dept.	Director (clin. and admin.), *assistant.	" "	" "	W.20
10	*Strasbourg.* — Univ. Hosp. Phys. Treatment Dept.	Directors, *assistants.	" "	All kinds requiring phys. treatment.	—
11	*Strasbourg.* — Mun. Baths Phys. Treatment Sect.	One doctor.	—	Chronic rheum., med. and traumatic.	—
12	*New York.*—Hosp. Joint Dis. Arthritis Clinic.	Physician to hospital in charge, *assistant.	Services of hospital.	Chronic arthritis.	A.h.
13	*New York.*—Hosp. Ruptured and Cripples, Arthritis Clinic.	Physician, specialist in chronic rheum., *assistant.	Specialist, group of outside men chosen by physician in charge to secure continuity. Lab., hosp.	" "	"
14	*New York.*—Cornell Univ. Hosp., Arthritis Clinic.	Physician to hosp., *assistant.	Services of hospital.	" "	"
15	*New York.*—U.S. Naval Hosp., Brooklyn, Phys. Treatment Dept.	Med. officer, specialist in phys. treatment.	" "	Chronic rheum., med. and traumatic.	"
16	*Philadelphia.*—Presbyterian Hosp., Arthritis Clinic.	Phys. to hosp. in charge, *assistants (2).	Clinic has own lab. for chem. physiol. and clin. research.	Chronic arthritis.	"
17	*Philadelphia.*—Gen. Hosp. (Mun.), Heart Clinic, Arthritis Sect.	Director (supervisory), chief assistant, assistants (3).	Services of hospital.	" "	"
18	*Philadelphia.* — Jefferson Hosp., Arthritis Clinic.	Physician in charge.	" "	" "	"
19	*Baltimore.*—Johns Hopkins Hosp.	—	Cases of chronic arthritis are treated by orthopædic surgeons and assistants.		—
20	*Boston.*—Peter B. Brigham Hosp., two arthritis clinics.	Two phys. to hosp., specialists in rheum. dis.	Of hospital.	Chronic arthritis.	A.h.
21	*Boston.*—Robert B. Brigham Hosp.	Large numbers of chronic arthritis cases treated as in-patients by orthopædists and physicians who have specialised in these diseases. Follow-up out-patient clinic.			

A.h., available in hospital; A.c., in clinic. W.20, ward of 20 beds.

* Throughout the table an "assistant" refers to a fully qualified senior man or woman, generally a specialist in physical treatment.

Notes.—3. At Brussels the director of the Brugman Hospital is professor of physical treatment in the University. 4. At Aachen the Landesbad Hospital is maintained by industries of the Rhine provinces. 7. At Vienna Prof. Wenckebach is head of University Clinic No. 1 and the director of the physical treatment departments his assistant. 13 and 18. In these hospitals the physician in charge has no other duties in the hospital.

FIFTH INTERNATIONAL CONGRESS OF MILITARY MEDICINE AND PHARMACY.

(LONDON, MAY 6TH–11TH.)

(Concluded from p. 1002.)

SCIENTIFIC SESSIONS.

ON Thursday morning, May 9th, papers were read on

Tropical Fevers of Short Duration.

Lieut.-Colonel W. P. MACARTHUR, Surgeon-Commander S. F. DUDLEY, and Wing-Commander H. E. WHITTINGHAM collaborated in the first paper. They divided the obscure short fevers of the tropics into two main groups—atypical or abortive attacks of known diseases and fevers which have still to be described. The closer the coöperation and the more thorough the work of clinician and pathologist, they said, the fewer fevers would fall into the second group. Typhoid, paratyphoid, and undulant fever had been found masquerading in mild or abortive form under a variety of local names. Malaria often caused a low continued fever without paroxysms and with so few parasites in the blood that they were easily overlooked. Another common kind of short fever seemed to be due to a disturbance of metabolism by heat; outbreaks of this sort often followed children's parties where violent games had been played in a hot sun. Dengue and phlebotomus fever might have so few definite symptoms that they were confused with similar syndromes. Influenza was very common in the tropics but seldom accompanied by nasal catarrh, and it was often impossible to separate it with certainty from dengue and sandfly fever. The group of leptospira seemed to contain many morphologically indistinct forms which could cause clinical symptoms varying from a day or two of pyrexia with conjunctivitis and a trace of albuminuria up to severe toxæmic jaundice. These should, however, be distinguished by the blood picture. If the fever was of acute onset and the examination of films had excluded the malaria parasite or the spirochæte of relapsing fever, then a leucopenia with a relative increase of large lymphocytes pointed to phlebotomus fever or dengue, while a leucocytosis with an absolute and relative increase of polymorphonuclear leucocytes suggested the Weil's disease group. Weil's disease could be distinguished from yellow fever by the amount of albumin in the urine, which was much greater in the latter. If, despite all investigations, a pyrexia remained really "of unknown origin," it should be so labelled, to avoid the confusion of calling the same condition "tonsillitis" in one station, "myalgia" in another, and "sandfly fever" in a third.

Dr. J. C. GERARDS (Dutch East Indies) said that identification of tropical fevers by geography and duration had been replaced by detection of the causative organism, and that during recent years several non-persistent fevers had been shown to be due to closely related organisms of the spirochæte family. Yellow fever was now under control in America, thanks to the discovery of the rôle of *Aëdes argenteus*, to antimosquito and quarantine measures, and to the Rockefeller Foundation, but it remained endemic in Africa. Noguchi appeared to have found correctly that the causative organism was the *Leptospira icteroides*, which several investigators believed to be identical with the *L. icterohæmorrhagiæ* of Weil. Others, however, had proved that the yellow fever spread by the mosquito could not be caused by *L. icteroides*, and that *A. argenteus* could not transmit both leptospiræ. Yellow fever was found exclusively in tropical and subtropical zones and there was no race immunity. The virus, which took about 12 days to develop, was present and active during the whole life of the insect. Mature females only bit at night, but the young females, before fertilisation, might bite by day. The incubation period of the disease was three to six days, and the differential diagnosis included malaria, Weil's disease, and dengue. Weil's disease and other spirochætoses were not apparently due to different organisms, but varied according to the degree of virulence, dose of toxin, and individual resistance. Weil's disease was found in Japan and many parts of Europe; the leptospira probably entered the body through skin abrasions or the digestive tract. The incubation period was five to six days and the diagnosis was confirmed by the presence of the organism in the blood in early stages and in the urine later. Prophylaxis included sterilisation of dejecta, destruction of rats, and prevention of bathing. Febris hebomadis was met in Japan, especially in the early autumn. Its leptospira was distinguished from *L. icterohæmorrhagica* by serological tests and was carried by the field rat and transmitted, probably, by insect bites. It was found in the blood during the first few days and in the urine after the eighth day. The symptoms were like those of Weil's disease and there was no mortality. African epidemic spirochætosis resembled yellow fever and Weil's disease with two types, one like yellow fever and the other a pneumonia with jaundice. The spirochæte was found in the blood, urine, and sputum, and was transmitted by *A. argenteus* and spread by fleas. Certain authorities believed that there was a form of hæmoglobinuric fever due to a leptospira. The spirochætosis febrilis described by Kouwenaar at Deli resembled hæmoglobinuric fever with or without jaundice, but Baermann considered it typical Weil's disease. Papataci fever, first described by Pym in 1804, was found along the Mediterranean, in Asia Minor, Northern India, Egypt, and Central America. The symptoms resembled those of dengue, but the cause was unknown. Four clinical types had been described, and the disease was usually mild with protracted convalescence. The virus of dengue was not known, but was present in the blood two or three days before symptoms appeared. Incubation was from five to nine days, immunity short, and convalescence slow. The mosquito was infectious for 11 to 14 days after biting, but the virus was not transmitted through ova. The five-day fever of Java was thought to be a polyneuritis-astheno-neuralgic fever comparable with the astheno-myalgic fever of Bernard. Fièvre d'Ancon, a mild disease like seven-day fever, had been described by Deeks in the Panama Canal Zone in 1912. Seven-day fever was described as a sporadic endemic fever of Indian ports and was not universally accepted as a separate disease from dengue.

The following officers took part in the discussion: Dr. SACQUÉPÉE, Dr. BLANCHARD, Colonel A. VAUDEMER, Dr. CAZANOVE, and Dr. A. P. CAWADIAS, the last-named discussing the recent Greek epidemic of dengue which had somehow arisen out of many previous small ones. Many cases of three-day fever, he thought, were really dengue.

At the discussion held on Friday, May 10th, on the

State of the Teeth in Relation to Physical Fitness in the Different Military Services,

the chair was taken by Colonel J. P. HELLIWELL. A joint paper was presented by Surgeon Lieut.-Commander J. T. WOOD, Captain H. S. WOODS, and Lieut.-Colonel (temporary Wing-Commander) C. L. COLBRAN. For the purposes of the paper they regarded the teeth and their attachments as the essential tissues of an organ, the function of which was adequate mastication of food so that the maximum nourishment might be obtained from it. The dental standard for enlistment defined the minimum degree of dental efficiency considered compatible with physical fitness in the Service, and was influenced by the need for maintaining establishments at full strength, the average dental condition of the recruits available, the provisions made for treatment, the period of engagement anticipated, any special qualifications of the individual, and the advantages and disadvantages of dependence upon artificial dentures.

The authors then described the standards in force in the three Services. In the Army a natural masticating power of 50 per cent. efficiency was the minimum. In the years 1924–5–6 an average of 5·3 per cent. of recruits were rejected for the Navy for purely dental reasons, the figure for the Army being 3·5 and for the Air Force 0·5 per cent. The figure was misleading for the Navy, because dental defects were roughly weeded out by the naval recruiters before the men were presented. The average recruit for the services had a neglected mouth and had had no treatment save extraction for the relief of pain. On admission, dental treatment was begun as soon as possible and oral hygiene was taught. Thereafter he was examined periodically and treated as occasion arose. He was always examined before proceeding abroad. In the Navy and Air Force a very high standard was insisted on for submarine, diving, and flying personnel. Officers were entitled to free treatment, but not to the supply of dentures. They were systematically examined in the Air Force, but not in the Army. If a soldier lost so many natural teeth that his nutrition was threatened, the deficiency could be made good by artificial dentures, but the wearers were always potentially inefficient, as the dentures were fragile, removable, and easily misplaced or broken, while partial dentures wore the remaining teeth and made constant attention essential. Therefore the need for dentures raised a very serious problem.

Infection of the dental tissues might produce closed or open dental sepsis, or both. The effect on physical fitness depended on four factors: the virulence of the infection, the volume of toxic products absorbed, the time factor, and the body resistance. The secondary or systemic effects fell into three main groups: (1) those due to absorption via the lymphatic system, as in closed infection. These included infective arthritis, toxic heart, and toxic neuritis. (2) Those due to absorption via the alimentary system, as in open dental infection. In this case the symptoms were not usually localised and appeared as general debility, rheumatism, or anæmia. (3) Those due to direct extension—e.g., affections of the antrum, ear, nose, and throat.

The authors then reviewed a series of illustrative cases among which it was noticeable that closed dental sepsis producing severe systemic lesions usually followed conservation of pulpless teeth, often by crowning. Most of the cases were officers; those "other ranks" were men who had been admitted before adequate measures were in force for the dental care of recruits.

Captain J. M. CLARK described

The Dental Service in the Cuban Army.

At the present time, he said, even the remotest district possessed excellent surgeries, but the service had failed to keep pace with the ever-advancing science of stomatology, and was hampered by obsolete regulations. He urged the importance to an army of a vital, scientific and progressive dental corps. Dental officers must insist on the inclusion of the necessary mineral elements in the dietary and should strive to improve the race by urging eugenic measures. The Army was the permanent vital power of the nation, and through it all fit citizens should pass. Teeth influenced all the phases of army life: discipline, action, and moral and physical efficiency. Healthy teeth could only be attained by careful preventive and curative methods. Propaganda must be carried on among the men, and a hygiene service should be instituted. When once the coöperation of the soldier had been secured, almost anything could be achieved. The ideal scheme would include: a dental card for each man, periodic general inspection at short intervals, observation of the frequency of certain ailments, reports to the dental officer of the district, cleanliness, and the use of embrocations and analgesics. Every soldier should be supplied with a pocket-case containing a dentifrice, tooth brushes, dental floss, litmus, a tincture for the gums, and cotton hyssop. The officers should advise the men on the use of the case and the choice of a dentifrice according to the reaction of the saliva to litmus. Hygienic precautions might prove harmful if carelessly or unintelligently applied. Oral hygiene could not be considered separately from general hygiene, and a soldier who did not keep his teeth in proper order could not be a good soldier. In Dr. Clark's opinion a well-restored tooth was preferable to the best substitute. Were the inefficiency of soldiers to be estimated on dental lesions, the result would prove staggering.

Major A. F. MACCALLAN read a paper entitled

The Eye as a Danger Signal of Dental Sepsis.

He said he had often met iritis, cyclitis, and choroiditis, together with blepharitis and ulceration of the cornea, as the result of dental sepsis. In fact, every corneal ulcer he had ever seen had been associated with unhealthy conditions of the teeth. Cataract in young patients was often due to the teeth. The mere deposition of tartar could cause iritis. In 82 out of 100 officers requiring spectacles, there had been apical abscesses. As well as blepharitis, opacities in the lens and vitreous, visible with the slit lamp, were often signs of dental disorder. It ought not to be left to the ophthalmologist to detect bad dental surgery.

Discussion.

A paper by Dr. CARIÈS (France) was read by Lieut.-Colonel GRAVELLAT HEURY. He spoke of the benefits of the new rules introduced in the French Army in 1925. No one need now be rejected on account of dental defect. The coefficient of mastication was estimated, as part of the medical examination, according to precise rules. When it was below a certain minimum, or the nutrition was impaired, a denture was fitted.

Dr. CHARLET (France) stressed the importance of the examination of metabolism.

Colonel J. P. HELLIWELL said that the number of recruits showing any benefit from treatment under the school dental service was negligible. He summarised the research work being carried out by the British Army dental service, and said that the great majority of the ill-effects were due to the attempt to preserve pulpless teeth. The differentiation of the various kinds of sepsis in a mouth might be of great diagnostic value. The uniform method of treatment now in force in the Army should greatly improve the dental condition of the men and their knowledge of oral hygiene, as well as raising the general standard of national health.

Dr. F. WATRY (Belgium) said that the dental standard ought to be part of the general standard of physical fitness and to be determined precisely. It should be modifiable for each individual. The period of military service ought to be used to inculcate habits of oral hygiene; the responsibility of Army medical and dental officers was to the whole race.

Major E. B. WAGGETT said that the man on campaign was better off with a denture than with gaps in his mouth. There was no serious risk of broken dentures; Army biscuits could be broken by a cracker, and if each man were supplied with a small box he would not put his denture under his pillow, and so break it in the morning. The two lower canines should never be left to fix a denture if they were unhealthy. Small dentures were a source of great danger, as they were apt to be swallowed.

Dr. R. BOISSIER (France) discussed focal sepsis.

Dr. J. FILDERMAN (Belgium) pressed for the fuller recognition of the dental services.

VISIT TO HALTON.

On Wednesday afternoon a party of 400 or more visited the Royal Air Force establishments at Halton, where the mysteries of aircraft construction were explained to them. Halton is essentially a training school, with 2500 to 3000 youths in residence, the course covering a period of three years, at the end measures as decapsulation of the kidneys and decompression of the kidney by Cæsarean section.

Dr. A. L. MUDALIAR (India) read a paper on Double Monsters, including a historical survey of fused twins, with especial reference to the possibility of separation.

Prof. MILES PHILLIPS (Sheffield) read a short note on a Successful Pregnancy following X Ray Stimulation of the Ovaries after Ten Years' Amenorrhœa. The literature, he said, showed that a number of normally developed children had been born after X ray therapy directed to the ovaries in certain cases of amenorrhœa accompanied by sterility. In the case under his care menstruation had promptly begun after treatment and pregnancy had soon followed, the child being delivered by Cæsarean section. It was essential to space the X ray exposures correctly in order to prevent irradiation of the newly fertilised ovum.

Dr. SOLOMONS believed that there was a great future for this form of treatment. He had had several cases of menstruation following prolonged amenorrhœa. He believed, however, that irradiation with X rays should be left until the last, and that an effort should be made with hormonic preparations and other stimulating drugs.—Prof. ADLER had had two cases of pregnancy following stimulation of the ovaries with X rays out of 40 cases treated in this way. The dosage was difficult to decide and must be very carefully regulated. —Prof. R. W. JOHNSTONE (Edinburgh) had treated several cases of amenorrhœa and agreed with Dr. Solomons and Prof. Adler about the dosage and endocrine gland treatment. He thought that coitus should not be allowed for two or three months after the establishment of the menses because the fœtal abnormalities that occurred were probably due to fertilisation of the ovum of the first few ovulations. He also said he had had good results from treatment by diathermy.—Prof. A. H. DAVIDSON (Dublin) described a case in which a woman of 40, who had been married for 20 years without any issue had rather profuse menstruation, for the stoppage of which X rays were employed. Menstruation had been reduced almost to normal, pregnancy had followed, and the result had been normal delivery of a healthy infant at full term.—The CHAIRMAN said that too much stress must not be laid upon trying to bring about menstruation before pregnancy could supervene as many cases became pregnant in the absence of menstruation.

In the afternoon demonstration operations were performed at various Dublin hospitals. Prof. Adler demonstrated the technique of local anæsthesia for vaginal operations.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

The Beginning of a Social Revolution.

WHEREAS in England each poor-law area has had its workhouse and its infirmary, in Scotland the functions of these two institutions have been combined in the poorhouse sick wards. About 30 years ago Glasgow formed two of her poorhouses into hospitals, each with a medical superintendent. These hospitals were still technically poorhouses, but for the first time the governor was a medical practitioner. In Edinburgh the sick wards of the two poorhouses—Craiglockart and Craigleith—became functionally more or less separate hospitals, with medical superintendents, but there was no definite separation of hospital from poorhouse.

In 1914 the War Office commandeered the fine building at Craigleith for a war hospital and, later, the Pensions Ministry continued and took the hospital over for their own purposes. Some time ago the Pensions Ministry restored Craigleith to the parish council and now, as part of the new development, the council have constituted Craigleith into a hospital proper. At the formal reopening by Dr. Parlane Kinloch, Chief Medical Officer of the Health Departments of Scotland, the chairman of the council said that Craigleith had been opened in 1868 and, with the various additions since made, the cost was about £83,000, which, in present-day values, would be something like £200,000. The buildings occupy, roughly, 15 acres and 20 acres more are available for new undertakings. There are about 120 beds and these are regarded as the nucleus of a much larger scheme. When the City Council takes over the functions of the parish council 12 months hence, Craigleith Hospital will be one of the institutions transferred.

Dr. Kinloch said that the achievement was great in itself, but much greater in its implications was the fact that the parish council and the other local authorities responsible for health services had been engaged in examining and moulding the original proposals of the Government for a far-reaching reform of the whole of the machinery of local government. To-day the provisions of the Local Government Reform Act made it possible for the first time, and for all time, to dissociate disease and incapacity from destitution. Craigleith Hospital itself becomes symbolic of the new hospital movement in Scotland. The new statute provides full powers for the coördination of all forms of hospital and medical schools, and it is significant that the secretary of the Hospitals Liaison Committee should be an officer of the Department of Health. The new Act makes it possible for the voluntary hospitals and the official hospitals to collaborate without being trammelled by the poor-law "stigma." For the first time sickness as a cause of destitution is absolutely dissociated from the poor-law. After 20 years the primary proposal of the Minority Report is realised in a Scottish statute. This is one of the greatest reforms in Scottish medical history.

Another Milk Experiment.

Some time ago details were given in THE LANCET (Jan. 5th, p. 40) of the Scottish school milk experiment. Another test is in progress under the Edinburgh and East of Scotland College of Agriculture and the Royal (Dick) Veterinary College at the Poultry Department, Liberton. Some 88 chickens, hatched on Jan. 14th, have been divided into four groups. It is unnecessary to give details of the feeding but one essential point is that two groups have had separated milk added to the diet; the two other groups have only had water added. The conditions in the poultry pens have otherwise been the same. The results of the three months' experiment are very striking. The groups whose diet has been supplemented by separated milk show a great proportional increase in weight as against the water groups. The average gain up to the ninety-fourth day is as follows: Group I. (milk), 1176 g.; Group II. (water), 542 g. In the other two groups the figures were: Group III. (milk), 1142 g.; Group IV. (water), 557 g. In the contrasted groups the diet has, of course, been otherwise the same. The differences of size between the milk sets and the water sets are very obvious. The milk-fed chickens are large and relatively lethargic, consuming extremely little greenstuff; the water-fed chickens are much smaller and more active, and are ravenous for greenstuff. It is amusing to see how, under a slight shower of snow, the milk-fed pullets will rush to shelter, while the others follow their active open-air life. The difference in size, condition, and activity is hardly credible, and if the number and quality of eggs produced correspond to the increase in size, the results should be remarkable. There have been differences in the incidence of disease among the groups, but the details of this are not yet available in report form.

Smoke Abatement.

The annual report (1928–29) of the Scottish Branch of the Smoke Abatement League contains a striking fact—namely, that in the 13 years during which classes have been held by the branch some 947 men have been enrolled for instruction in the latest methods of stoking furnaces for steam-raising purposes and in economic fuel combustion. It has often been stated by men familiar with factory methods that, if proper stoking were adopted, there would be no smoke problem for the factories. This has been known for at least 40 years, but its application has hitherto not been encouraging, to say the least. The report urges the Secretary of State for Scotland to apply to Scotland the same principles as were applied to England in the Public Health (Smoke Abatement) Act, 1926. Why this has not been done already is difficult to explain. But one difficulty has been the methods followed at the great iron-smelting works at Coatbridge and elsewhere where, apparently, it is impossible to prevent smoke without such a radical reconstruction of plant as would wipe out the industry. In Scotland, iron and steel have been for years almost at the bottom of their prosperity and, probably, the representations of the manufacturers prevailed against any radical treatment of the smoke problem of particular areas. But improvement is only a matter of time. Meanwhile domestic smoke is the great problem, and this can be solved only by the steady displacement of crude coal by smokeless coal, by gas, and by electricity.

An interesting question has been raised by Dr. R. M. Buchanan, *bacteriologist to the Corporation of Glasgow*, who traces the decay of sandstone in buildings and monuments definitely to the action of bacteria in a smoke-polluted atmosphere.

> "The process of decay," he is reported as saying, "had hitherto been ascribed to the direct solvent action of adventitious gases in the atmosphere, arising from the combustion of coal or emanating from chemical works. On the other hand, its resemblance to an infective process was one of its chief characteristics. It was associated with many micro-organisms, some of which were capable of deriving sustenance from materials absorbable in solution from polluted atmospheres. The end-products of decay were to be regarded as the result of chemical changes induced by the growth of living organisms in the stone. However improbable at first sight it might appear, by a logical factor it was essential to the process and brought it into line with other reducing processes in nature."

This and other smoke problems were the subject of discussion at the annual meeting of the Scottish branch in Edinburgh on May 3rd.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The Social Insurance Law and the Medical Syndicates.

THE conflict between the Government and the medical profession is beginning as a kind of preliminary engagement between outposts. While negotiations are being carried on in diplomatic secrecy between the leaders of the profession in Paris and the Government, the local syndicates in the country *départements* are examining the situation in which the new law is going to place them. The physicians of the Département du Nord have been the first, I believe, to pass a resolution that is in flat revolt against the law. This resolution says that the law as it actually stands is wholly incompatible with the honest and proper practice of medicine and will not give the patients the care they ought to have: "The physicians of the Département du Nord refuse their collaboration to the Insurance Law as it stands at present."

Considering that this department is one of the most important in France, by its industry, its mining districts, and its working population, whilst its physicians are known for their high standards and are strongly organised with a remarkable man, Prof. Vanverts, at their head, we may expect that the Government will take good notice of their protest. It is not unlikely that it will ask Parliament to modify the law as was promised when it was hurriedly voted for just before the last elections, the deputies being afraid to go to the polls without having decided at least upon its principles.

Failures of Whipple's Diet.

Everyone agrees that Whipple's liver diet is a wonderful cure and should be applied in all cases of anæmia, the Biermer type being the principal indication. At the last session of the Société Médicale des Hôpitaux Dr. Prosper-Emile Weil, one of the prominent hæmatologists, reported the case of one of his patients who, having been cured a first time of pernicious anæmia by Whipple's liver diet, got no benefit at all of the same diet six weeks later, and died. He observed that it should never be forgotten that exceptional cases may be encountered in which liver diet has no effect, and a similar opinion was expressed by several other members of the Society from their own experience.

Is Arteriography Permissible in Practice?

Dr. Reynaldo dos Santos has lately given a lecture before the Paris Société de Chirurgie, to which he belongs as a Portuguese associate member, on the injection into arteries of a saturated solution of sodium iodide to permit of radiographic exploration—a method already employed by Egaz Moniz of the same country, for cerebral arteries. Dr. dos Santos showed the Society splendid radiograms of arterial distribution obtained in this way, but at the next meeting there was some little disturbance over the suggestion, and one of the leading Paris surgeons, Prof. Lecène, said that certain methods of investigation should be reserved for experimental work, and he did not believe that a physician should be allowed to inject into a man's blood so caustic a substance as a saturated sodium iodide solution; he had seen lesions caused in the ureter by much weaker solutions. Many other members of the Society also held the view that this attempt, if it may be regarded as interesting from the scientific standpoint, should not be repeated and that the method should not enter into routine practice.

Prof. Roussy's Election to the Academy of Medicine.

Dr. Roussy, professor of pathological anatomy and histology in the Faculty of Medicine, has been elected a member of the Academy of Medicine of Paris. A pupil of Dejerine, with whom he described the thalamic syndrome, one of his main works has been the study of lesions of the infundibulum and the tuber cinereum, which he regards as governing the metabolism of water and fat, and responsible, by default, for Fröhlich's syndrome. He showed, with Camus, that the hypophysis is not the source of those troubles, and that previous experiments had caused lesions of both regions; whereas minute dissection made it certain that a lesion of the hypophysis could not by itself create the syndrome, whilst the destruction of the nuclei of the tubero-infundibular region was alone sufficient and necessary. Since the war Prof. Roussy has devoted his time to cancer, and it will be remembered that some weeks ago Mr. H. S. Souttar gave readers of THE LANCET [1] an account of what is being done in his cancer centre, not only for scientific work, but also in social propaganda against the disease.

Public Health Services.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 4TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 356 (last week 354); scarlet fever, 2152; diphtheria, 1028; enteric fever, 29; pneumonia, 1348; puerperal fever, 47; puerperal pyrexia, 109; cerebro-spinal fever, 18; acute poliomyelitis, 4; acute polio-encephalitis, 4; encephalitis lethargica, 23; dysentery, 10; ophthalmia neonatorum, 106. No case of cholera, plague, or typhus fever was notified during the week.

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[1] THE LANCET, Feb. 9th, p. 300.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on May 7th-8th was as follows:—Small-pox, 338 under treatment, 12 under observation (last week 308 and 22 respectively); scarlet fever, 1518; diphtheria, 1070; enteric fever, 9; measles, 100; whooping-cough, 1027; puerperal fever, 20 (plus 10 babies); encephalitis lethargica, 80; poliomyelitis, 4; "other diseases," 61. At St. Margaret's Hospital there were 11 babies (plus 3 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was 1 death from small-pox, 4 (0) from enteric fever, 60 (1) from measles, 10 (0) from scarlet fever, 103 (31) from whooping-cough, 38 (6) from diphtheria, 35 (7) from diarrhœa and enteritis under two years, and 102 (18) from influenza. The figures in parentheses are those for London itself.

The death provisionally classified to small-pox was assigned to West Ham C.B. The death mentioned in last week's return should have been assigned to Acton M.B., and not to Brentford and Chiswick U.D. No great town reported more than three deaths from influenza, except Birmingham with 5, Wallasey, Manchester, and Sheffield with 4 each. Birmingham reported 11 deaths from measles, Manchester 8 deaths from whooping-cough. Of the 25 deaths from diarrhœa outside Greater London 8 were reported from Birmingham.

The number of stillbirths reported during the week was 251 (corresponding to a rate of 36 per 1000 births), including 56 in London.

Deaths from Small-pox.—The death assigned to Northampton C.B. in the week ended April 27th, was that of a woman of 59 years, who was notified as suffering from small-pox on April 23rd, and was removed to hospital the same day. Dr. Stephen Rowland, medical officer of health, tells us that the attack could not be called severe, but her condition was complicated by severe laryngitis. She was also suffering from extensive foul varicose ulcers of many years' standing. She gradually sank and died on April 25th, the death certificate being signed "Acute laryngitis, small-pox." She had been vaccinated in infancy and showed four faint marks.

Since January of this year over 430 cases of small-pox have occurred in the County Borough of West Ham. Two of these cases have died while under treatment for small-pox. The first case was that of a girl aged 2 years (unvaccinated), who was seen by Dr. F. Garland Collins, medical officer of health, on March 24th, and at once removed to hospital suffering from small-pox and broncho-pneumonia. The rash developed on the day of removal, but the child had been unwell and had suffered from a cough for several days. A brother of the patient, a newsboy aged 17 years, had been removed to hospital suffering from small-pox on March 12th from the same house, which was both dirty and over-crowded. The girl died six days after admission. The rash was scanty and the small-pox was of mild type. It is doubtful, Dr. Collins writes, whether or not this child would not have died from broncho-pneumonia even had it not developed small-pox.

The second death, which occurred on April 28th, was that of a woman aged 41 years. The son of this woman was one of the crew of the s.s. *Tuscania*, who arrived in West Ham after being discharged from his ship at Liverpool on April 2nd. He felt unwell on the 6th, when he was seen by a doctor. On the 8th a rash developed, and he was removed to hospital. This man had evaded vaccination when it was being performed upon members of the crew before they left the boat. The mother, who was unvaccinated and a direct contact, refused vaccination on the day the son was removed to hospital. She was taken ill on April 24th—i.e., 16 days after the removal of her son—was removed to hospital on the 26th, and died of small-pox on the 28th. Owing to the dangerous condition of the son this mother was permitted to visit him at the Small-pox Hospital on about nine occasions. On April 12th she consented to be vaccinated at the hospital; as the vaccination did not "take," she was vaccinated again on the 18th, and again with a negative result. Dr. Collins adds that not one of the 12 other direct contacts of the son who were vaccinated on the 8th contracted the disease.

DARLINGTON WAR MEMORIAL HOSPITAL.—This institution is to be enlarged by the addition of three new wards and an operating theatre at a cost of £60,000. These additions will bring up the accommodation to 150 beds.

Correspondence.

"Audi alteram partem."

THE NEW IMPORTANCE OF RADIUM.

To the Editor of THE LANCET.

SIR,—It has taken 30 years to develop a technique that yields reasonably good results in one or two groups of cancer. In these groups the routine is becoming more or less standardised, but in the greater number of cases—cancers of breast, of abdomen, and in fact in almost any position except the lip, larynx, and uterus—the results are disconcertingly erratic and the technique is still in its experimental stages.

Looking back one sees that progress has always come from institutes where intensive methods of study are possible—i.e., when there are large numbers of cases, adequate supplies of radium, *and* where accessory methods such as X rays, diathermy, and surgery are available. In this country progress has come from the Radium Institutes of London, Manchester, and the Middlesex Hospital, but it is comparatively little compared to that which has emanated from the Radiumhemmet of Stockholm or the Brussels and French clinics. We look almost in vain for any advance from individual workers and from ordinary general hospitals. In the present boom of radium the idea seems to be to scatter this beneficent agency broadcast and to overlook the fact that it requires such highly specialised technique and knowledge that it can only be used to full advantage in a few centres. We see surgeons and gynæcologists rushing across to Brussels and elsewhere and, after a week of observation, returning as experts, writing up a few cases, and imagining they are advancing scientific progress. We shall not wisely use the great gift of radium with which the country is supplying the medical profession unless we look at the history of the last 30 years and learn the lesson which is plain. To obtain the best results and to make progress it is obvious that we must centralise our resources. setting up, say, half a dozen efficiently staffed centres with subcentres as in France, perhaps, where radium can be expertly handled by those who specialise in this work and with whom it is not merely a sideline, and where the accessories—a really efficient X ray service, surgery, and diathermy—are also available. with expert and experienced workers. A correspondent in the *British Medical Journal* has already made this suggestion (April 27th, 1929).

It is argued that patients are often too ill to travel; if so they are probably beyond all hope of effective treatment, and obviously the diagnosis should have been made much earlier. Medical men who do not recognise cancer until the patient is in such an exhausted condition are certainly not likely to be competent to treat it by these newer methods. Naturally patients like being treated by their own doctors, and also prefer to remain as near home as possible, but surely these are minor considerations. and neither the feelings of the patient nor the self-sufficiency and self-interest of the medical man should stand in the way of progress. The treatment should not be for those who are in extremis and as a last resort, but applied early, when there may be a reasonable hope of success. Radiation treatment should be the first, not the last agency to be used.

A centralising scheme such as this would involve travelling to the centres, but there is no reason why funds should not be allocated to pay these expenses, as is done in Sweden, two centres serving the whole of that large country most efficiency, each case being followed up and literally almost forced to present himself for observation and further treatment at the discretion of the authorities of an institute that is really expert in the combined use of radium, X rays, diathermy, and surgery—four agencies which are under the control of one expert. Expert knowledge of radium and X rays is of far greater importance than expert surgery, which—in the surgery of access—is a comparatively simple matter. In other words, the expert who controls the treatment should be the man who has expert knowledge of the most potent weapons—i.e., radium and X rays.

In the composition of the Committee that is to control these radium resources we note that those who have done the spade work, those who are experts in these methods, are hardly represented. It is assumed that surgeons who perhaps possess a little radiological knowledge should be the controlling influence—the actual control of the resources should be in the hands of those who not only possess some knowledge of surgery, but who have training and experience in radiation therapy such as can only be acquired by years of study and experience. If this attitude of surgical predominance persists we shall make no progress, for in the treatment of cancer surgery is practically a failure and there is no progress in spite of all the advance in modern technique. We have explored all the possibilities of surgery; we are just beginning to explore the more hopeful realms of radiation treatment. Till we realise that it is surgery and not radiation treatment which should now be regarded as the refuge of the destitute we shall not progress. I am, Sir, yours faithfully,

Cambridge, May 13th, 1929. A. E. BARCLAY.

To the Editor of THE LANCET.

SIR,—The priority of the Middlesex Hospital in the use of large quantities of radium externally should not be forgotten in the discussion in your columns, as it has been by Sir Charles Gordon-Watson in your last issue. In 1920 two and a half grammes were lent to the Middlesex Hospital by the Medical Research Council, largely owing to the initiative of my predecessor, the late Dr. Cecil Lyster. The large amount of valuable experimental and clinical work done with radium tubes and a "bomb" by Prof. Lazarus-Barlow, Prof. Sidney Russ, and Dr. Helen Chambers is recorded in the 1922 report on "The Medical Uses of Radium" of the Medical Research Council (No. 62).

Later on this radium was split up and distributed to other centres, but for about two years half a gramme was available for surface use, and I was, I believe, one of the first to use such a large quantity from a distance such as six centimetres. The patients treated were mostly surgical rejects, but valuable results, in some instances still continuing good, were obtained, as recorded in the reports to the Medical Research Council, and, briefly, in your own columns.[1] The establishment of the "Radon Centre" prevented the continuance of this study at the Middlesex, but, as I said in the discussion on Dr. Max Cheval's interesting paper [2] on the Brussels four-gramme "bomb," read before the Medical Society of London on March 28th, 1928, it is to be hoped that this method will not be neglected for long in England, as it promises well not only in gynæcological but in several other departments of cancer therapy.

I am, Sir, yours faithfully,
J. H. DOUGLAS WEBSTER.

Chandos-street, London, W., May 11th, 1929.

BLOOD STANDARDS.

To the Editor of THE LANCET.

SIR,—As the Haldane instruments used at Salford Royal Hospital are prepared by the original makers, Dr. Goodhart's suggestion does not explain our difference. The standards show no variation amongst themselves, and I have tested the pipettes by the mercury method and found them exceedingly accurate. I do not attach much weight to checking a result with a second opinion, because in the Salford laboratory I have known five opinions in agreement upon a single sample. On one occasion the bloods of the laboratory staff were tested, and every stage of the estimations gone through to the satisfaction of four observers. The results of presumably normal people ranged from 79 to 89 per cent. The comparisons were made by daylight and artificial light, in each case by transmitted and reflected light.

Both Dr. Goodhart and I are firmly convinced that we are right and the discussion could be quoted by a chemist to illustrate the inaccuracies inherent in all colorimetric methods of analysis. It appears to me that the only way to test the unconscious error of different observers would be to insert various dilutions of blood and the standard into an apparatus similar to that used by ophthalmologists to detect malingerers claiming to be blind in one eye. With this device it is, I understand, impossible to say whether an object is on the right or left in actual fact, or whether two images of a single object are being seen. Such a test might provide some entertainment to the onlookers. I am, Sir, yours faithfully,

Manchester, May 10th, 1929. C. E. JENKINS.

A NEW SIGN OF MEASLES.

To the Editor of THE LANCET.

SIR,—With reference to the note in your issue of May 4th (p. 962) on the appearance of small hæmorrhages on the buccal mucous membrane in the prodromal stage of measles—a sign which Dr. Geza Pétenyi has not found mentioned hitherto in medical literature—I should like to say that I have not only frequently seen this phenomenon, but have also stated on p. 271 of my work on "Acute Infectious Diseases" (1925) that "minute hæmorrhages on the buccal mucous membrane often precede the occurrence of Koplik's spots."

I am, Sir, yours faithfully,

Western Hospital, S.W., May 3rd. J. D. ROLLESTON.

SERVICE UNIFORM.

To the Editor of THE LANCET.

SIR,—Many of us who have served and who are serving will agree with your remarks last week (p. 1000) as to the sombre effect of the service uniforms of the officers of the R.A.M.C. at the recent International Congress of Military Medicine. A smarter uniform than khaki is urgently needed for ceremonial occasions such as this, and some form of suitable full dress with a neat *shako* in lieu of the old *pickelhaube* helmet should be authorised. A grant should be made towards the cost and it should be obtainable through ordnance stores. The Navy have a suitable uniform for such occasions; why should not the Army? It is false economy too, both from the standpoint of esprit de corps and recruiting, to further withhold any longer the re-issue of full dress for ceremonial and "walking out" from our regular and territorial armies.

I am, Sir, yours faithfully,
RUSSELL STEELE,
Captain, late R.A.M.C.

Royal United Service Institution, Whitehall,
London, S.W., May 13th, 1929.

PRIMOGENITURE AND ABNORMALITIES.

To the Editor of THE LANCET.

SIR,—With reference to Dr. M. T. Macklin's article in your last issue, I should like to refer readers to my letter [1] to you of Oct. 22nd, 1927, where I endeavoured to show by a priori reasoning that Dr. Still's view was not justified. Dr. Macklin now confirms my contention a posteriori.

I am, Sir, yours faithfully,

Shortlands, Kent, May 12th, 1929. A. WOHLGEMUTH.

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[1] THE LANCET, 1926, i., 431; 1928, ii., 63.

[2] Trans. Med. Soc. Lond., 1928, li., 409–437.

[1] THE LANCET, 1927, ii., 942.

SUBMUCOUS RESECTION OF THE NASAL SEPTUM.

To the Editor of THE LANCET.

SIR,—In his comment on your annotation of Feb. 2nd (p. 244) Mr. Macleod Yearsley has expressed (Feb. 9th, p. 307) certain opinions about the operation, with some of which I agree and with others I do not. Mr. Yearsley has done over 1000 of these operations; I have done probably five times as many. I began *in London in 1911 and continued here, except during* visits to America, the Continent, and Britain, where I have seen the operation performed by many people.

General anæsthesia never appealed to me; I believe it unnecessary and adds to the risk of sepsis. With cocaine and adrenalin locally applied and the injection of a weak solution of neocain and adrenalin, perfect anæsthesia is secured. I had my own septum removed under local anæsthesia without pain or discomfort. The amount of cartilage and bone to be removed is *always a subject of dispute. I believe the ethmoidal* plate and the vomer should be widely removed because they are nearly always thick and irregular, and that the chief site of obstruction is far back. Mr. Yearsley has, I think, missed the principal point in removing the cartilage, which was not to tear the fibrous ligament attaching the septal cartilage to the junction of the nasal bones. If this be torn in rough handling then a depressed tip is bound to follow. Another point is to have a counter opening far back, by making a cut in one of the muco-perichondrial flaps, and so obviate the risk of a hæmatoma. I always use one catgut suture and regard this as absolutely necessary. But the incision made is *only a short vertical one*; there is no need to make the horizontal incision along the crest as performed by many. I use packing sometimes and sometimes not. We rarely see sepsis, hardly one case in 1000.

I think if Mr. Yearsley does the extensive operation which most of us think necessary he will see a few cases where the soft septum will fall to the under side in sleep, at any rate until final scarring tightens up the tissues. Our experience is that the difficulty encountered in so-called flapping is due not to the septum but to paralysis of the alæ nasi. This paralysis we combat by asking the patients to wear vulcanite dilators (specially made for each patient) during the night.

I think it is wrong to remove the enlarged posterior ends unless they are morulated. We all used to remove these poor posterior ends while taking out adenoids, and I now believe we were wrong. Mr. Yearsley probably believes as I do that the inferior turbinal is the most precious organ in the body, being the guardian of the lungs. That being so, it should be protected against the ruthless surgeon.

I am, Sir, yours faithfully,
T. A. MACGIBBON.

Christchurch, N.Z., March 26th, 1929.

PATHOLOGICAL POSTURES.

To the Editor of THE LANCET.

SIR,—I am reluctant to enter into controversy with Dr. Walshe, especially upon a subject to which he has made such valuable contributions. But I must ask to be allowed to reply to his criticism, expressed in his Oliver-Sharpey lecture which you published last week, of my views on the hemiplegic posture. I do not propose to discuss here the validity of the "appeal to phylogenesis" as an explanation of pathological postures, but I would point out that there is nothing inconsistent between a physiological and a biological explanation of a posture. Dr. Walshe's physiological interpretation of the flexed upper limb in hemiplegia is not in the least incompatible with my biological one, and is therefore not a valid argument against it. The two conceptions are in fact complementary.

Dr. Walshe is, I feel, a little unfair in extracting the quadrupedal extensor reflex from its context in my paper, for it was only one of a number of pieces of evidence in favour of my interpretation of the hemiplegic posture, and by no means stands alone. Extensor spasticity in the human upper limb is a problem of great interest and importance which otherwise Dr. Walshe does not discuss at all. My argument was that an identical posture of spastic extension of the upper limb was present in the "cerebellar fits" of Hughlings Jackson, in quadruplegia produced by lesions of the spinal cord, in the quadrupedal extensor reflex and in the normal standing attitude of the anthropoid apes. Kinnier Wilson has interpreted this posture, when it occurs in "cerebellar" or tonic fits, as decerebrate rigidity. Riddoch and Buzzard have adopted a similar interpretation of the posture in spinal quadruplegia, and I have applied it to the quadrupedal extensor reflex. Extension of the forelimb in the decerebrate animal is, as Sherrington has shown, reflex quadrupedal standing. Dr. Walshe regards such a phylogenetic explanation of extensor spasticity in the human upper limb as illegitimate. It would be interesting to hear his alternative explanation.

Lastly, Dr. Walshe himself demonstrates the difficulty of avoiding phylogenetic explanations. Referring to the tonic neck and labyrinthine reflexes in man he says: "We may state at once that these reactions belong to the group of tonic reflexes described by Magnus and de Kleijn in the decerebrate animal." Now Magnus and de Kleijn described and interpreted these reflexes in decerebrate quadrupedal animals, and they are intimately associated with quadrupedal standing. Dr. Walshe in one of his papers has shown that identical reactions are found in hemiplegia in man. What explanation except a phylogenetic one has he to offer for this?

I am, Sir, yours faithfully,
W. RUSSELL BRAIN.

Harley-street, W., May 12th, 1929.

BLOOD-SUGAR ESTIMATIONS IN THE TROPICS.

To the Editor of THE LANCET.

SIR,—Those using the Folin and Wu method for blood-sugar estimations in the tropics may have been troubled by the weak colour often developed after the addition of the molybdic acid solution to the water-cooled mixture of filtrate and alkaline copper solution removed from the water-bath. If this mixture is thoroughly cooled in *iced water* for about five minutes prior to the addition of the molybdic solution the difficulty referred to above is completely overcome. Perhaps this note may prove of some value to those who are using the Folin and Wu method in warm climates.

I am, Sir, yours faithfully,
ALBERT J. HAWE, M.B., M.R.C.S., W.A.M.S.

Gold Coast Hospital, Accra, April 26th, 1929.

SECONDARY FEVER IN SMALL-POX.

To the Editor of THE LANCET.

SIR,—As cases of small-pox are occurring from time to time it may be useful to give a personal experience which I had lately as superintendent of a small-pox hospital. Three cases of an acute discrete type, and five others of an ordinary character, were treated with the following application twice daily to all spots: calamine, grs. 15; pure lysol, ♏ 16; equal parts of white vaseline and zinc ointment to 1 oz. In none of the cases so treated was there any secondary fever; all admitted that the ointment completely removed irritation. Except for aperients and cholagogues, of which phenolphthalein, cascara evacuant, calomel, mag. sulph., and petroleum were used, no diaphoretic treatment was adopted.

I am, Sir, yours faithfully,
L. L. BURTON, F.R.C.S. Edin.

Thurleigh-road, Clapham, S.W., May 13th, 1929.

TREATMENT OF ULCERS OF THE LEG.

To the Editor of THE LANCET.

SIR,—I read with interest Dr. J. H. Young's note in your issue of May 11th on the treatment of ulcers of the leg with magnesium sulphate. This treatment, satisfactory though it is, does not appear to have any advantage over treatment with Unna's paste. Indeed it has the disadvantage that the patient is kept in bed. The treatment with Unna's paste, combined with injection of the varicose veins (if any) is ambulatory and astonishingly satisfactory. I do not think there is any particular virtue in the Unna's paste. I have used pastes of slightly different consistency and they all appear equally effective. It would seem that the crux of the matter lies in the fact that the œdematous tissues are supported and rendered non-œdematous. The only things required are a jam-jar of Unna's paste melted in a saucepan of boiling water, a wool-carrier or brush, and a couple of ordinary 2½-in. bandages. The leg is coated with paste and the bandage applied fairly tightly from the ankle upwards, more paste being worked in as one goes on. Pieces of lint can be incorporated in the bandage in the case of large ulcers. About one and a half bandages are required for a large leg. The dressing can be left on for a week even in the case of multiple large ulcers. It will naturally be a bit smelly on removal. In any case in which syphilis is suspected mercury and iodide may be given. Under this treatment the pain is relieved and the ulcers fill up and epithelialise rapidly. Later the dressing can be left on for two or three weeks.

I do not think the medical profession realises the simplicity and potency of this treatment. One sees very old ulcers on legs whose owners have taken them from hospital to hospital and the ulcers are still there. The patients are convinced that they will take them to the grave, indeed there is a widespread idea that if an old ulcer is healed up the patient will undergo rapid dissolution. In the Midlands most of these cases gravitate to institutions where they are relieved of large fees and left with their ulcers.

I am, Sir, yours faithfully,

A. ERNEST SAWDAY,
M.B., B.S. Lond., F.R.C.S. Edin.

Derby, May 11th, 1929.

THE NOMENCLATURE OF PLACENTA PRÆVIA.

To the Editor of THE LANCET.

SIR,—As the subject of placenta prævia is to be discussed at the annual meeting of the British Medical Association in July, it seems opportune to suggest that the terminology of the subject be reviewed and, if possible, standardised. The difficulty lies with the two types described variously as lateral and marginal. Whitridge Williams and Fothergill, to quote two writers, describe the type in which the placenta partially covers the os as lateral, and the type in which the placenta merely extends on to the lower uterine segment as marginal. Other writers, Johnstone and Fairbairn amongst them, refer to the former as marginal and the latter as lateral. This has given rise to confusion in the past, especially in the teaching of students, and must inevitably do so when treatment is being discussed.

It is perhaps unfortunate that the condition cannot be described under the two headings central and lateral, but the treatment is so dependent on the relationship between the edge of the placenta and that of the cervix, at the time at which it has become necessary to interfere, that it would be essential to describe, as a subdivision of the second, a third type—namely, that in which the edge of the placenta does not reach the edge of the cervix, and incidentally the type in which artificial rupture of the membranes and application of a binder is adequate treatment.

As lateral and partial have already been used to describe the same or intermediate type, may I suggest that the term lateral be dispensed with entirely in favour of the more descriptive term partial, and that the three types be referred to as central, partial, and marginal? I recognise, of course, that any classification must refer only to the state of affairs at the time of examination, as a case appearing central when the os will only admit one finger may prove to be partial when dilatation has proceeded further.

I am, Sir, yours faithfully,

E. A. GERRARD,
Resident Obstetric Surgeon, St. Mary's Hospitals,
May 13th, 1929. Manchester.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt. R. W. Higgins to be Surg. Lt.-Comdr.

The following appointments are notified: Surg. Comdr. R. F. Quinton to *Emperor of India;* Surg. Lts. G. D. J. Ball to *Barham* (on transfer of flag); E. C. Downer to *Vivid;* J. J. Keevil to *Revenge;* and C. G. Rippin to *Royal Oak* (on transfer on flag).

Surg. Lt. (Short Service) G. Rorison transferred to Permanent List.

Surg. Lt. (D.): H. M. Hill to Greenwich; and L. M. Hughes to *Victory*, for R.N. Barracks, Portsmouth.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. W. F. Tyndale, having attained the age for compulsory retirement, is placed on ret. pay.

Maj. and Bt. Lt.-Col. W. Benson to be Lt.-Col., vice Lt.-Col. W. F. Tyndale to ret. pay.

Col. N. J. C. Rutherford, late R.A.M.C. (ret.), to be Med. Offr., The Tower of London.

Maj. L. A. B. Moore (ret., R.A.M.C. Mila.) to be Temp. Maj.

Capt. J. M. Morrison to be Maj.

Lt. on prob. W. G. Harvey is secd. under the provisions of Art. 205, Royal Warrant for Pay and Promotion, 1926.

ARMY DENTAL CORPS.

Capt. H. L. McCallum to be Maj.

SUPPLEMENTARY RESERVE OF OFFICERS.

Lt. A. Roberts resigns his commn.

TERRITORIAL ARMY.

Lts. H. S. Ward and S. Orchard to be Capts.
Lt. J. B. Dedman, from Gen. List, O.T.C., to be Lt.
P. D. Thomson to be Lt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Capt. P. E. H. Adams, having attained the age limit, relinquishes his commn. and retains his rank.

INDIAN MEDICAL SERVICE.

Lt.-Col. W. V. Coppinger to be Col.
Capt. A. M. V. Hesterlow to be Maj.

EXTENSION OF BIRMINGHAM GENERAL HOSPITAL.—A casualty department and three wards are to be built on the newly acquired portion of St. Mary's Churchyard at a cost of £47,000. This will not only relieve the congested casualty and out-patients' departments, but will provide 60 additional beds. Thirty pay-beds have recently been opened and are rapidly being taken advantage of. Owing to the constant increase in the number and difficulty of operations it has been decided to appoint two resident surgical registrars to assist the honorary surgeons with in-patients. The appeal for £5500 for radium has been completely successful. A certain quantity of radium will now be available for the production of "radon."

SALOP ORTHOPÆDIC HOSPITAL.—Proposals are being considered for the entire rebuilding of the Shropshire Orthopædic Hospital and Agnes Hunt Surgical Home. The building, which was originally erected for temporary military use, is said to be very inconvenient and in an unsatisfactory condition. A new building, facing the playing fields of Shrewsbury School, would cost £80,000. The Cripples' Training College, which has grown out of the work of the hospital, is to be housed in buildings recently purchased. The boys and girls who are being trained are taught, among other things, surgical boot making and repairing and surgical appliance making.

MEDICAL GRADUATES FOR PARLIAMENT.

IN the Parliament which was dissolved on May 10th there were 13 Members of the House of Commons with medical degrees or diplomas. Eleven of them, along with Lord Dawson and four coöpted University representatives, sat as a Parliamentary Medical Committee with Dr. F. E. Fremantle as chairman, and Dr. Drummond Shiels as hon. secretary. Lord Moynihan took his seat as a peer just before the end of the Parliamentary session.

Nominations for the new Parliament, which meets on June 30th, can be made until Monday, May 20th, but the following is a complete list of the candidates so far as we know at present. A dagger sign denotes membership of the recent House of Commons, while an asterisk indicates that the candidate contested a seat unsuccessfully at the previous General Election in 1924. Polling day for most of the constituencies is May 30th, but the election may close a little later for University seats.

Universities.

†Sir George Berry.
Dr. J. Kerr.
†Dr. E. Graham Little.
†Prof. T. Sinclair.

London Boroughs.

*Dr. Ethel Bentham.
Dr. C. W. Brook.
Dr. J. D. Cooke.
Dr. R. C. Cooke-Taylor.
†Sir Henry Jackson.
*Dr. H. B. Morgan.
†Dr. Alfred Salter.
*Dr. G. E. Spero.
Dr. W. H. Summerskill.

English Boroughs.

*Dr. F. G. Bushnell.
*Dr. L. Haden Guest.
*Mr. Somerville Hastings.
Dr. A. B. Howitt.
Dr. J. W. Leech.
†Sir Richard Luce.
*Dr. R. O. Moon.
Dr. Joseph Robinson.
†Sir Thomas Watts.

Scottish Burghs.

†Dr. Walter E. Elliot.
†Dr. Drummond Shiels.

English Counties.

*Rt. Hon. Christopher Addison.
*Dr. Stella Churchill.
†Dr. A. Vernon Davies.
†Dr. F. E. Fremantle.
†Mr. H. C. Haslam.
Dr. R. Lyons.
Dr. R. A. Lyster.
Dr. J. V. Shaw.

Welsh Counties.

Dr. J. H. Morris-Jones.
†Dr. J. H. Williams.

Scottish Counties.

Dr. J. Hunter.
Dr. R. Forgan.

Some Personal Records.

Miss **ETHEL BENTHAM**, M.D. Brux., L.R.C.P. Edin., who is once again standing in the Labour interest for East Islington, is medical officer to the Memorial Baby Clinic at North Kensington and a justice of the peace. Her special interest lies in the direction of child and maternal mortality and morbidity which she connects in the main with bad housing and faulty conditions of life, including especially the ever-present dread of unemployment. She wants to see some method of bridging the gulf of medical attendance for boys and girls between 14 and 16, a time in which she has found in her practice much damage is done for want of it.

Sir **GEORGE BERRY**, F.R.C.S. Edin., LL.D., has sat in the House of Commons since 1922, and is standing for the fourth time for one of the two Scottish University seats, the other Unionist candidate being Mr. John Buchan. He has been President of the Royal College of Surgeons of Edinburgh and of the Ophthalmological Society of the United Kingdom, and was for a number of years a member of the Edinburgh University Court. If elected he will continue to work for the educational, investigational, and other interests of medicine. As a consulting surgeon he has lived in intimate contact with general practitioners for whom he has a profound admiration.

CHARLES W. BROOK, M.A. Camb., M.R.C.S., who has been adopted as Labour candidate for Balham and Tooting, qualified in 1925, and is medical director of an artificial sunlight clinic. He is placing public health and the improvement of social services in the forefront of his election campaign. His Liberal opponent is also a medical man.

Mrs. **STELLA CHURCHILL**, M.R.C.S., D.P.H., who is standing as Labour candidate for Brentford and Chiswick, took the Natural Science Tripos at Cambridge in 1905, and is medical officer to a welfare and a sunlight clinic. It is unfortunate, she writes, that the British Medical Association will not support the candidature of medical men or women who do not bind themselves by the policy of the Association in regard to State medical services. This means, in effect, that the Association is the mouthpiece and protector only of the private general practitioner and not of the medical profession as a whole. She would like to see the policy which candidates are required to support published in full in the medical press.

J. **DOUGLAS COOKE**, M.B. Melb., F.R.C.S. Eng., who is contesting Peckham in the Conservative interest, stands for the full Baldwin programme without modification. He qualified in 1902 and has retired from practice.

C. R. **COOKE-TAYLOR**, M.R.C.S., who is standing as Liberal candidate for the Dulwich division of Camberwell, is a barrister-at-law who took his medical diplomas in 1927. This is the fourth time he has contested the seat and the sixth time he has stood for Parliament. In the forefront of his programme is the Papworth scheme for dealing with tuberculosis. He notes the activity in his own constituency as elsewhere of antivaccination propaganda.

A. **VERNON DAVIES**, O.B.E., M.B. Vict., is standing for re-election in the Royton division of Lancashire as a supporter of Mr. Baldwin. He has retired from practice and is a commissioner in the St. John Ambulance Brigade.

F. E. **FREMANTLE**, O.B.E., M.D. Oxf., F.R.C.S. Eng., F.R.C.P. Lond., who is standing again for the St. Albans Division of Hertfordshire as a Conservative, has sat in four Parliaments, and has been chairman for several years past of the non-party Parliamentary Medical Committee. His agent, Lieut.-Colonel R. J. Slaughter, would be glad to receive offers of help from readers prepared to lend cars on polling day, to speak for him at public meetings, or otherwise assist his candidature. Address: Conservative Central Committee Rooms, 2, Upper Dagnall-street, St. Albans.

HENRY C. HASLAM, M.A., M.B., D.Sc. Camb., who is standing again for the Horncastle Division of Lincolnshire, is a biochemist attached to the Pathological Laboratory, Cambridge.

SOMERVILLE HASTINGS, M.S. Lond., F.R.C.S. Eng., who sat in the Parliament of 1923–24 and is again standing as Labour candidate for the borough of Reading, is surgeon in charge of the ear and throat department at the Middlesex Hospital. In his election he is, as usual, stressing public health matters.

A. B. **HOWITT**, C.V.O., M.D. Camb., who is standing in the Conservative interest for Preston, Lancs, was Epsom Scholar at St. Thomas's Hospital, qualifying in 1906, and holding a number of hospital appointments including that of resident medical officer to St. Thomas's Home. He is son-in-law to Lord Marchamley.

A. **JOSEPH G. HUNTER**, *M.C.*, M.D., F.R.C.S. Edin., who is Liberal candidate for the county of Dumfries, is assistant surgeon to the Dumfries and Galloway Royal Infirmary and medical officer to the Dumfries Prison.

Sir **HENRY JACKSON**, M.A. Camb., D.Sc. Lond., M.B. Edin., is standing for re-election in Central Wandsworth, where he was for three years mayor. In his election programme he is stressing slum-clearance, reconditioning of old houses, and coördination of traffic in Greater London. The last-named policy would, in his judgment, relieve the congestion of our streets, reduce the appalling mortality from accidents, and ensure a steady reduction of fares.

E. G. **GRAHAM LITTLE**, B.A. Univ. Cape Good Hope, M.D., F.R.C.P. Lond., who is again standing as an Independent candidate for London University, is in charge of the Skin Department at St. Mary's Hospital, London. He has been a member of the University Senate since 1905, and was elected in 1924 with a

TREATMENT OF ULCERS OF THE LEG.

To the Editor of THE LANCET.

SIR,—I read with interest Dr. J. H. Young's note in your issue of May 11th on the treatment of ulcers of the leg with magnesium sulphate. This treatment, satisfactory though it is, does not appear to have any advantage over treatment with Unna's paste. Indeed it has the disadvantage that the patient is kept in bed. The treatment with Unna's paste, combined with injection of the varicose veins (if any) is ambulatory and astonishingly satisfactory. I do not think there is any particular virtue in the Unna's paste. I have used pastes of slightly different consistency and they all appear equally effective. It would seem that the crux of the matter lies in the fact that the œdematous tissues are supported and rendered non-œdematous. The only things required are a jam-jar of Unna's paste melted in a saucepan of boiling water, a wool-carrier or brush, and a couple of ordinary 2½-in. bandages. The leg is coated with paste and the bandage applied fairly tightly from the ankle upwards, more paste being worked in as one goes on. Pieces of lint can be incorporated in the bandage in the case of large ulcers. About one and a half bandages are required for a large leg. The dressing can be left on for a week even in the case of multiple large ulcers. It will naturally be a bit smelly on removal. In any case in which syphilis is suspected mercury and iodide may be given. Under this treatment the pain is relieved and the ulcers fill up and epithelialise rapidly. Later the dressing can be left on for two or three weeks.

I do not think the medical profession realises the simplicity and potency of this treatment. One sees very old ulcers on legs whose owners have taken them from hospital to hospital and the ulcers are still there. The patients are convinced that they will take them to the grave, indeed there is a widespread idea that if an old ulcer is healed up the patient will undergo rapid dissolution. In the Midlands most of these cases gravitate to institutions where they are relieved of large fees and left with their ulcers.

I am, Sir, yours faithfully,

A. ERNEST SAWDAY,
M.B., B.S. Lond., F.R.C.S. Edin.

Derby, May 11th, 1929.

THE NOMENCLATURE OF PLACENTA PRÆVIA.

To the Editor of THE LANCET.

SIR,—As the subject of placenta prævia is to be discussed at the annual meeting of the British Medical Association in July, it seems opportune to suggest that the terminology of the subject be reviewed and, if possible, standardised. The difficulty lies with the two types described variously as lateral and marginal. Whitridge Williams and Fothergill, to quote two writers, describe the type in which the placenta partially covers the os as lateral, and the type in which the placenta merely extends on to the lower uterine segment as marginal. Other writers, Johnstone and Fairbairn amongst them, refer to the former as marginal and the latter as lateral. This has given rise to confusion in the past, especially in the teaching of students, and must inevitably do so when treatment is being discussed.

It is perhaps unfortunate that the condition cannot be described under the two headings central and lateral, but the treatment is so dependent on the relationship between the edge of the placenta and that of the cervix, at the time at which it has become necessary to interfere, that it would be essential to describe, as a subdivision of the second, a third type—namely, that in which the edge of the placenta does not reach the edge of the cervix, and incidentally the type in which artificial rupture of the membranes and application of a binder is adequate treatment.

As lateral and partial have already been u
describe the same or intermediate type, may
gest that the term lateral be dispensed wit
in favour of the more descriptive term
that the three types be referred to as ce
and marginal? I recognise, of course,
fication must refer only to the state
time of examination, as a case
when the os will only admit one
to be partial when dilatation h

I am, Sir, yours f

E.

Resident Obstetric Su

May 13th, 1929.

The

ROYAL N

Surg. Lt. R. W.
The following
R. F. Quinton
Ball to *Barham*
J. J. Keevil
transfer on
Surg. Lt.
Permanen
Surg.
Hughes

Lt.-Col.
compulsory ret
Maj. and Bt. L
Lt.-Col. W. F. Tyndale
Col. N. J. C. Rutherfor
Offr., The Tower of London.
Maj. L. A. B. Moore (ret., R
Maj.
Capt. J. M. Morrison to be Maj.
Lt. on prob. W. G. Harvey is se
of Art. 205, Royal Warrant for Pay and Prom

ARMY DENTAL CORPS.

Capt. H. L. McCallum to be Maj.

SUPPLEMENTARY RESERVE OF OFFICERS.

Lt. A. Roberts resigns his commn.

TERRITORIAL ARMY.

Lts. H. S. Ward and S. Orchard to be Capts.
Lt. J. B. Dedman, from Gen. List, O.T.C., to be Lt.
P. D. Thomson to be Lt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Capt. P. E. H. Adams, having attained the age limit, relinquishes his commn. and retains his rank.

INDIAN MEDICAL SERVICE.

Lt.-Col. W. V. Coppinger to be Col.
Capt. A. M. V. Hesterlow to be Maj.

EXTENSION OF BIRMINGHAM GENERAL HOSPITAL.—A casualty department and three wards are to be built on the newly acquired portion of St. Mary's Churchyard at a cost of £47,000. This will not only relieve the congested casualty and out-patients' departments, but will provide 60 additional beds. Thirty pay-beds have recently been opened and are rapidly being taken advantage of. Owing to the constant increase in the number and difficulty of operations it has been decided to appoint two resident surgical registrars to assist the honorary surgeons with in-patients. The appeal for £5500 for radium has been completely successful. A certain quantity of radium will now be available for the production of "radon."

SALOP ORTHOPÆDIC HOSPITAL.—Proposals are being considered for the entire rebuilding of the Shropshire Orthopædic Hospital and Agnes Hunt Surgical Home. The building, which was originally erected for temporary military use, is said to be very inconvenient and in an unsatisfactory condition. A new building, facing the playing fields of Shrewsbury School, would cost £80,000. The Cripples' Training College, which has grown out of the work of the hospital, is to be housed in buildings recently purchased. The boys and girls who are being trained are taught, among other things, surgical boot making and repairing and surgical appliance making.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Prorogation and Dissolution.

PARLIAMENT was prorogued on Friday, May 10th, and dissolved by Royal Proclamation later in the day. The Royal Assent was given by Royal Commission to a large number of Acts including the Finance Act, the Local Government (Scotland) Act, the Pharmacy Act, the Age of Marriage Act, Infant Life (Preservation) Act, and the Artificial Cream Act. In the King's Speech reference was made to the announcement by H.M. Government of their intention of taking the necessary action for the acceptance, subject to reciprocity, of the Protocol prohibiting chemical and bacteriological methods in warfare. The Dominion Governments had announced a similar intention. Reference was also made to the inquiry into the radium requirements of the country in the light of the knowledge and experience gained as to the importance of radium in the treatment of cancer; and the decision of the Government to contribute to a fund for the acquisition of a stock of radium. It was His Majesty's earnest hope that this action might prove a substantial step forward in the campaign against one of the most distressing maladies known to mankind.

HOUSE OF COMMONS.

TUESDAY, MAY 7TH.

SCOTTISH HEALTH SERVICES.

The House went into Committee on the Scottish Estimates. On the vote for the Scottish Department of Health.

Major **ELLIOT** (Under Secretary for Scotland) said that the estimates this year were increased by £260,000. There were one or two main lines by which they could test the value received for the expenditure on the health services. The figures for infant mortality were 86 per 1000, compared with 89 per 1000 last year. The figures for ten years came out at about 92 per 1000, so that there had been a very important saving in life. The figures, however, were not satisfactory compared with those of England and other countries in the Empire. Maternal mortality remained high both in Scotland and in other countries with a high standard of living. It did not appear to yield to a general advance in the prosperity of the country as did infant mortality. The death-rate from tuberculosis was 97 per 1000 of the population this year as compared with 99 last year and 116 in 1924. Those figures compared favourably with world figures. Health benefit payments showed a disquieting tendency to increase and establish itself at a successively higher level. In the first four months of last year the total cash benefits paid out were £875,000, and for the first four months of this year they were £981,000. That was not entirely a case for reproach on the health side. In that morning's issue of the *Times* he had given an account of some tests that nature had carried out in East Africa, where two tribes had been found living under similar conditions. One consumed a great deal of milk while the other did not. The tests carried out at Aberdeen gave a similar result to that reached in East Africa, and showed that there was a marked improvement in the health of school-children by the addition of a small amount of milk to their diet. Much constructive work had been done for the prevention of disease, and in Scotland they were fortunate in possessing a close and intimate link between the Department of Health and the voluntary hospitals and medical schools associated with those hospitals. One of the great tasks of a future Government would be to make sure that full use was made of the Local Government Act. About £68,000 per annum was being spent on the Highland and Island service and no more beneficent work could be imagined. Without the provision made by this service the inhabitants of the Highlands and Islands of Scotland would be without proper medical treatment. The fund, however, had been living on its savings for some time and it would be the duty of the new Government, after the General Election, to maintain and enlarge the provision made for this important service.

Importance of Nursery Schools.

Dr. **DRUMMOND SHIELS** said that it was false economy to cut down expenditure on public health. In times of stringency other things should be sacrificed before the public health services. The 11,000 houses that had been provided in Scotland towards slum clearance was a miserable contribution to the problem. He was very glad to notice in the report of the Department the emphasis laid on the importance of dealing with children between the ages of 2 and 5 years in nursery schools. The importance of these schools was being increasingly realised. These nursery schools were not so much schools in the ordinary sense of providing education, though they might provide facilities for inculcating habits of discipline and so on. Their object was to remove children from playing in the gutter and to give them a chance of having physical defects remedied. It was true, as the report stated, that the school medical officers and other medical men were assured that tonsils, adenoids, and similar defects, which were such a nuisance and such a cause of anxiety to the parents during the ordinary school life of the children, had their beginning at that period of life, and, if they were promptly dealt with it would mean a very great improvement, not only in regard to the saving of time, but in the health of the children. There were 350,000 such children in Scotland and only by a system of nursery schools could the problem be satisfactorily tackled. He did not know what the position in Scotland generally was, but in Edinburgh plans had been made for starting one nursery school in the immediate future. A big programme of nursery schools would be put into active operation if the Labour Party came into power after the General Election. The Under Secretary for Scotland had dealt very interestingly with the problem of maternal mortality, child welfare, and infant mortality, all of which were more or less grouped together. He was glad to notice that in the report Dr. Finlayson's figures were given. He (Dr. Shiels) had given those figures in the House before, but they were so tremendously significant that they were well worth repeating. Dr. Finlayson found that, taking an average of four years from 1924 to 1927, in the case of women who received antenatal attention, the deaths in childbirth or immediately after were only 3 per 1000, whereas in the case of those who had no antenatal attention the figures were 7 per 1000. Taking 1927 by itself the figures were even more remarkable, because in the case of the women who had antenatal attention the mortality-rate was 2·4 per 1000, and in the case of those who received no antenatal attention it was as high as 11·2 per 1000. Although those figures were limited, they proved conclusively that there was a very marked difference in the deaths of mothers according to whether or not they had received attention before confinement. The antenatal centres in Scotland were neither numerous nor good enough. In the large towns like Glasgow and Edinburgh there were a certain number of such centres, but more were required, and they ought to be so situated as to be convenient of access to the women, who should not have to travel long distances. As a considerable period of waiting was in some cases inevitable the centres should be made more comfortable. Some of the centres had no suitable conditions for examination which did not encourage women to attend. It should be remembered that working women were just as sensitive and had as much delicacy as women of other classes. The Department of Health ought to urge all local authorities which had antenatal centres to see that they should be such as would encourage women to attend. Strong pressure should be put on the local authorities which had no such centres at all, because they were sure that antenatal supervision would save life.

Housing Conditions and Tuberculosis.

It was satisfactory, so far, that the figure for infant mortality was down to 86, but the figure had always been higher in Scotland than in England, and there was no question that it was due to the difference in housing conditions. The same steady progress was being made in regard to tuberculosis, but he would like to see it greater. There, again, it was really a housing question. They were spending a great deal of money on sanatoria and on the treatment of tuberculosis, but the best medical authorities believed that if they could provide decent housing conditions they could sweep away the whole problem of tuberculosis in a generation. Not very much prominence had been given to the question of venereal disease. The difficulty in regard to this disease was that they did not know whether it was decreasing, or whether they were getting down to the causes. They knew that more people were attending, and there seemed to be a very definite increase in gonorrhœa, although the evidence in regard to syphilis was that it seemed to be not increasing. They did not know whether the increase in gonorrhœa simply meant that more people were attending or whether there was an actual increase. This disease was so important and was costing the local authorities and the country so much money that until they had some method such as was suggested in the recent Edinburgh Bill of dealing with it, they would continue to have inadequate results from a very large national expenditure. The report brought out the fact that every four years, or about three times in the school life of a child, it was medically inspected. That was not enough. There should be a medical inspection of every child at least once a year, and certainly the staff would have to be increased. That would be a great economy, because if, in the course of their school life they could attend to the physical conditions of the children they could turn them out at the end not only well educated, but also physically well equipped. Attention should also be paid to systematic and daily exercises for the children at school. They could honestly congratulate Major Elliot on the interest which he had taken in the experiment with regard to milk and, probably, for its initiation. It was also a tribute to the usefulness of the Empire Marketing Board. The uniting of the two experiments, one in Scotland and the other as far off as East Africa, was not only of great scientific interest but of great practical importance. The good work which Prof. Leighton had done and the interest he had taken in this subject for many years, in encouraging the milk producers of Scotland to supply pure and cleaner milk ought to be recognised. The present nomenclature of graded milk was misleading. People thought that Grade A milk was the best quality, whereas the Certified milk was the best. He would like information as to the quality of the non-graded milk. Did the Department take steps to obtain any samples of milk, and to subject them to bacteriological examinations? It should be made a serious crime to sell tuberculous milk.

Health Insurance.

It might be said that the national health insurance scheme in Scotland was now well organised and working well. The report called attention to the fact that the action taken under the Economy Act by reducing the State grant had gravely prejudiced the possibility of extension of the dental and ophthalmic services. It was the duty of the Government to make the national health insurance system really comprehensive and to enable the contributors to it to have at their command every medical and surgical aid. At present they were thrown back on the voluntary hospitals, which were overcrowded and had not enough beds. He echoed the hope expressed by Major Elliot in regard to the new hospital services under the Local Government Bill. That section of the Bill would provide a possible development of municipal service to supplement the voluntary service, and would make it possible for the ordinary citizen to obtain the specialist advice which was absolutely essential. Medicine had become so vast in so many directions that the ordinary practitioner could not be expected—and did not pretend—to be an authority on all its branches. It was only by the hospital services, or by specialist aid, that that could be overcome. The Labour Party were sympathetic in regard to research. There was, for example, the question of influenza. Present knowledge of that disease was very limited. Research was badly needed. Measles and whooping cough, which were not very seriously regarded by the public, were actually two of the most serious diseases, but they were not making a great deal of progress in regard to them. The entire sum which this wealthy country spent on research of all kinds was only about £20,000, and it would be a tremendous thing if, by research work, even a few hundred lives could be saved in Scotland each year. He wished to emphasise the importance of proper dental treatment for children. Most local authorities in Scotland had made such provision, but two of them—Argyllshire and Bute—had no provision at all. He was very glad to hear Major Elliot's reference to the Highlands and Islands Fund. He (Dr. Shiels) had had an opportunity of seeing its work in Shetland and Orkney, and there was no question about its tremendous value and necessity. The Department of Health should put some pressure on local authorities in the North of Scotland who had failed to provide maternity and child welfare services.

Reply to the Debate.

Major ELLIOT, replying to the debate, said that the Health Department were taking active steps to deal with maternal and infant mortality. Their expenditure in the current year was 50 per cent. greater than the expenditure for which the Labour Government was responsible. With regard to the milk tests, it was a question of quality, not of quantity. Last year 2249 cattle affected by tuberculosis were slaughtered and the process of cleaning up the cattle was continually going on, and was bound to result in an improvement in public health. There was no increase in the number of school-children suffering from malnutrition compared with last year.

The vote was agreed to.

THURSDAY, MAY 9TH.

The London Lock Hospital.

Mr. PETHICK-LAWRENCE asked the Minister of Health whether he had now any information to give the House as to the reforms proposed at the London Lock Hospital.

Captain T. J. O'CONNOR asked the Minister of Health whether, having regard to the damage already done to the careers of the three women dismissed from their posts at the London Lock Hospital, he would state whether the committee of inquiry had exonerated them.—Mr. CHAMBERLAIN replied: I am glad to be able to add to the statement which I made in the House on April 30th that a conference has, I understand, been held to-day between representatives of the governing body of the hospital and of the former ladies' committee. The object of the conference was to reach agreement both on proposals made by the Board for the future management of the hospital and on the action to be taken with respect to certain former members of the staff. I am not in a position to inform the House of the results of the conference, but I think hon. Members will learn with satisfaction that it has been held, and will regard the Board's action in seeking it as evidence of their desire to promote the harmonious and successful working of the hospital.

Accidents in Coal Industry.

Mr. BATLEY asked the Secretary for Mines the number of miners employed and the number of fatal and non-fatal accidents in the coal industry for the years 1924, 1925, 1927, and 1928, respectively.—Commodore DOUGLAS KING replied: The figures are as follows:—

Year.	Mines under the Coal Mines Act, 1911.		
	Number of persons employed.	Number of persons killed.	Number of persons disabled for more than three days.
1924 ..	1,230,248	1201	195,423
1925 ..	1,117,828	1136	178,060
1927 ..	1,037,391	1128	173,449
1928 ..	951,632	989	161,790

Cost of Vaccination.

Mr. BROAD asked the Minister of Health what was the total cost of vaccination from the rates and taxes in England and Wales for the years 1923 to 1928; and the number of persons vaccinated and revaccinated at the cost of the rates during those years.—Mr. CHAMBERLAIN replied: The particulars required, so far as they are at present available, are given in the following table:—

Year ended Sept. 30th.	Successful Primary vaccinations.	Successful revaccinations.	Total.	Year ended March 31st.	Expenditure of Guardians.	Grants from Exchequer contribution accounts.	Total
					£	£	£
1923	415,549	316,641	732,190	1923	181,172	10,244	191,416
1924	331,522	89,600	421,122	1924	223,924	11,753	235,677
1925	270,755	40,939	311,694	1925	179,027	3,050	182,077
1926	279,721	54,221	333,942	1926	161,889	4,366	166,255
1927	305,005	113,117	418,122	1927	170,728	8,338	179,066

It will be observed that the figures of expenditure and of vaccinations, respectively, refer to different periods and cannot, therefore, be strictly related to one another.

Barking Hospital Sweepstake.

Mr. DAY asked the Home Secretary whether it was on his instructions that the Derby sweepstake organised in aid of the Barking Hospital Fund had been stopped by the police.—Sir W. JOYNSON-HICKS replied: It having been brought to my notice that the hospital committee had announced to all donors of 3*d.* a grand Derby draw, were sending out tickets for sale, and offering a consolation prize to the seller of most tickets, I had the promoters and the printers of the tickets warned that to proceed in this way was a breach of the law, and I was informed on April 22nd that the scheme had been abandoned.

British Hospitals Association and Radium.

Mr. BLINDELL asked the Minister of Health what response he was sending to the resolution passed at the annual meeting of the British Hospitals Association recently held in London offering the advisory services of the Association to the Ministry and the Radium Subcommittee as to the best and most convenient centres for radium treatment.—Mr. CHAMBERLAIN replied: This resolution has not yet been formally submitted to me, but I propose to bring its terms to the notice of the bodies through whom the new supply of radium will be administered as soon as they are set up.

Mental Deficiency Report.

Mr. ROBERT MORRISON asked the Minister of Health whether he had now decided to publish the adult section of the Mental Deficiency Report; and when it would be available.—Mr. CHAMBERLAIN replied: The answer is in the affirmative and the report will be published as soon as possible.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At a congregation on May 11th the following degrees were conferred:—

M.B. and B.Chir.—J. L. Franklin.
B.Chir.—*A. B. Connell and C. A. Francis.
* By proxy.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—An extraordinary comitia of the College was held on April 9th, with Sir John Rose Bradford, the President, in the chair.

Dr. Robert Stevenson Aitken, of New Zealand, was admitted to the membership, and the following, who were elected to the Fellowship on April 25th (see THE LANCET, May 4th, p. 957), were admitted to the Fellowship:—Dr. R. W. Marsden, Dr. Rupert Waterhouse, Dr. A. Gurney Yates, Dr. K. D. Wilkinson, Dr. T. L. Hardy, Dr. Geoffrey Bourne, Dr. A. C. Roxburgh, Dr. B. T. Parsons-Smith, Prof. A. W. M. Ellis, Dr. Harold Gardiner-Hill, Dr. J. H. Sheldon, Dr. J. M. H. Campbell, Prof. J. H. Dible, Dr. D. H. Paterson, Dr. Crighton Bramwell, Dr. A. F. Tredgold, Dr. Hugh Gainsborough, Dr. A. H. Douthwaite, Dr. Donald Hunter, Prof. H. M. Turnbull, and Prof. Lovatt Evans, F.R.S.

The President presented the report of the committee appointed to consider the desirability of instituting a diploma in obstetrics and gynæcology. The resolution unanimously passed by the committee was as follows:—

> "The committee is of opinion that the institution of a diploma in Obstetrics and Gynæcology, jointly with the Royal College of Surgeons, is desirable, and that it should be referred to the Committee of Management to consider the best method of meeting the broad practical needs of this department of medical science by means of such a diploma."

Dr. T. W. Eden proposed an amendment, seconded by Dr. Russell Andrews, that the question of instituting a diploma in obstetrics and gynæcology should be referred in the first place to a committee of the Obstetric Fellows of the College who should report recommendations to the President. This amendment was put to the vote and was defeated. The original resolution was then adopted.

The President announced that Dr. F. G. D. Drewitt had presented to the College an engraving of the Chelsea Physic Garden—a garden of which Dr. Drewitt had written a very charming history and which had many associations with the College.

The Treasurer proposed that a donation of 100 guineas should be made by the College to the National Radium Fund, and this was agreed to.

The President then dissolved the comitia.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At an ordinary meeting of the Council, held on May 9th, with Lord Moynihan, the President, in the chair, Sir George Makins was introduced, and the President presented him with the honorary gold medal of the College, together with a document declaratory of its award, in appreciation of his valuable services to the College, more especially in arranging and describing the series of drawings in the Army Medical War Collection. Prof. W. Blair Bell was also introduced, and, after signing the by-laws and making the required declaration, was admitted a Fellow of the College.

Prof. Charles A. Pannett was elected a member of the Court of Examiners for a period of five years.

The following, nominated by the Canadian Medical Association, were appointed to act as assessors to the examiners at the primary examination for the Fellowship to be held at Toronto on August 6th, 7th, and 9th, for which there are 30 candidates: Prof. J. P. McMurrich and Prof. C. H. Best. Sir Holburt Waring was appointed to go to Toronto in August as visitor to the Primary Fellowship Examination.

An offer by Mr. W. W. Ouless, R.A., to present to the College his portrait of Sir Arthur Keith was accepted with appreciative thanks.

Diplomas of Member were conferred upon 151 candidates (136 men and 15 women) who have passed the requisite examinations and have complied with the by-laws of the College. The names of these candidates are identical with those published in our issues of May 4th and 11th, with the exception that W. F. Skaife received his Membership in April. J. H. Boultbee, Liverpool University, received the diploma of Member, but will not receive the diploma of L.R.C.P. until a later date.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.—The annual general meeting of the Fever Hospital Medical Service Group of this society will be held at the society's house, 1, Upper Montague-street, London, W.C., on Friday, May 24th, at 3 P.M. After the election of officers Dr. W. Mair MacFarlane will open a discussion on the Uses of Scarlet Fever Antitoxin.

MEDICAL CONGRESS AT BRUSSELS.—The ninth session of the Journées Médicales de Bruxelles will be held from June 22nd–26th under the presidency of Prof. Henry Coppez. A feature of especial interest in the programme will be a visit to the new Faculty of Medicine at Brussels, which is described as the most complete and best-equipped in Europe. Particulars of the Congress may be had from the secretary-general, Dr. R. Beckers, 62, rue Froissart.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.—A quarterly meeting of the College was held on May 7th, when Dr. R. A. Fleming, the President, was in the chair.

Dr. Ella Ferrier Pringle and Dr. John Miller Woodburn Morison were introduced and took their seats as Fellows.

Dr. Frederick William Woolrabe, Lieut.-Colonel John Philip Cameron, I.M.S., Dr. Helen May Russell, Major Ambuj Nath Bose, I.M.S., Dr. Andrew Rae Gilchrist, Dr. Matthew Burn, and Dr. David Rutherford Dow were elected to the Fellowship.

The Parkin prize was awarded to Dr. Harold Whitridge Davies. The Freeland Barbour Fellowship was awarded to Dr. John Smith Fraser.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—On Tuesday, May 21st, at 8.30 P.M., Dr. L. S. T. Burrell will give the fifth lecture arranged for the M.R.C.P. course, at 11, Chandos-street, Cavendish-square, W. He will speak on Modern Methods of Diagnosis and Treatment in Pulmonary Tuberculosis. The sixth lecture of the same course, on Tests of Hepatic and Pancreatic Functions, will be delivered by Dr. H. E. Archer on Friday, May 24th, at the same place and hour. Copies of the full syllabus, and tickets of admission may be had from the Secretary of the Fellowship, at 1, Wimpole-street, London, W. 1, together with particulars of other courses and lectures which have been arranged.

UNIVERSITY OF LONDON MEDICAL GRADUATES SOCIETY.—The annual meeting and May dinner of the society was held at the Langham Hotel on May 7th, this President, Sir StClair Thomson, being in the chair. Medical graduates of the University, he pointed out, numbered over 4000, and there was still scope for an increase in membership. The society, having been formed at the right time, before the actual construction of the University centre had begun, was ready to play its part in the development of the corporate spirit of the University. Sir Charlton Briscoe's proposal to re-elect the president for a second year of office was carried unanimously. On the proposal of Dr. Herbert Tilley, the three vice-presidents, Sir John Rose Bradford, Lord Moynihan, and Dame Mary Scharlieb, were also re-elected. Six new members of council were elected—viz., Dr. Rhoda Adamson (Leeds), Mr. Harry Platt (Manchester), Dr. Louisa Hamilton, Mr. Victor Bonney, Dr. A. M. H. Gray, and Sir Thomas Horder—completing the number of 18 for which the constitution of the society provides.

MEDICAL WOMEN'S FEDERATION.—The annual meeting was held on May 2nd at the Holborn Restaurant, London. The annual report showed a steady increase in the membership. The hon. treasurer stated that the loan funds had proved of great assistance to young practitioners.

The Council held its half-yearly meeting on May 3rd at the London School of Medicine for Women. Dr. Catherine Chisholm was elected president for a second year: Dr. A. E. Sanderson Clow, Dr. Alison Hunter, and Miss L. Martindale, vice-presidents; Dr. Jane Walker, hon. treasurer; and Miss Mabel Ramsay, hon. secretary. Amongst matters discussed was the report of the London University Committee on Co-education of Medical Students. Stress was laid on the fact that there are women medical students in Great Britain and the British Empire who need a school in London where they may receive their medical education on co-educational lines. The report of the Special Committee which gave evidence before the Government Departmental Committee on the Working of the Midwives Acts was adopted. The executive committee was instructed to prepare a list of names of medical women who are doing National Health Insurance work, so that at the next council a standing committee might be appointed and the interests of women panel practitioners better correlated. A vigorous protest was made by council members at the insertion in the *British Medical Journal* of an advertisement for an assistant (medical woman), who was asked to do light household duties in combination with professional work. A discussion took place in regard to the treatment by medical women of cases of venereal disease in hospitals and clinics, and a resolution was adopted urging that the medical officers treating female venereal disease cases, whether in hospital or clinics, should be women medical practitioners where and whenever such practitioners are available.

In the evening a dinner was given by members of the council, past and present, to Lady Berry, hon. secretary of the Federation for ten years, on her retirement.

not only well educated, but also physically well equipped. Attention should also be paid to systematic and daily exercises for the children at school. They could honestly congratulate Major Elliot on the interest which he had taken in the experiment with regard to milk and, probably, for its initiation. It was also a tribute to the usefulness of the Empire Marketing Board. The uniting of the two experiments, one in Scotland and the other as far off as East Africa, was not only of great scientific interest but of great practical importance. The good work which Prof. Leighton had done and the interest he had taken in this subject for many years, in encouraging the milk producers of Scotland to supply pure and cleaner milk ought to be recognised. The present nomenclature of graded milk was misleading. People thought that Grade A milk was the best quality, whereas the Certified milk was the best. He would like information as to the quality of the non-graded milk. Did the Department take steps to obtain any samples of milk, and to subject them to bacteriological examinations? It should be made a serious crime to sell tuberculous milk.

Health Insurance.

It might be said that the national health insurance scheme in Scotland was now well organised and working well. The report called attention to the fact that the action taken under the Economy Act by reducing the State grant had gravely prejudiced the possibility of extension of the dental and ophthalmic services. It was the duty of the Government to make the national health insurance system really comprehensive and to enable the contributors to it to have at their command every medical and surgical aid. At present they were thrown back on the voluntary hospitals, which were overcrowded and had not enough beds. He echoed the hope expressed by Major Elliot in regard to the new hospital services under the Local Government Bill. That section of the Bill would provide a possible development of municipal service to supplement the voluntary service, and would make it possible for the ordinary citizen to obtain the specialist advice which was absolutely essential. Medicine had become so vast in so many directions that the ordinary practitioner could not be expected—and did not pretend—to be an authority on all its branches. It was only by the hospital services, or by specialist aid, that that could be overcome. The Labour Party were sympathetic in regard to research. There was, for example, the question of influenza. Present knowledge of that disease was very limited. Research was badly needed. Measles and whooping cough, which were not very seriously regarded by the public, were actually two of the most serious diseases, but they were not making a great deal of progress in regard to them. The entire sum which this wealthy country spent on research of all kinds was only about £20,000, and it would be a tremendous thing if, by research work, even a few hundred lives could be saved in Scotland each year. He wished to emphasise the importance of proper dental treatment for children. Most local authorities in Scotland had made such provision, but two of them—Argyllshire and Bute—had no provision at all. He was very glad to hear Major Elliot's reference to the Highlands and Islands Fund. He (Dr. Shiels) had had an opportunity of seeing its work in Shetland and Orkney, and there was no question about its tremendous value and necessity. The Department of Health should put some pressure on local authorities in the North of Scotland who had failed to provide maternity and child welfare services.

Reply to the Debate.

Major **Elliot**, replying to the debate, said that the Health Department were taking active steps to deal with maternal and infant mortality. Their expenditure in the current year was 50 per cent. greater than the expenditure for which the Labour Government was responsible. With regard to the milk tests, it was a question of quality, not of quantity. Last year 2249 cattle affected by tuberculosis were slaughtered and the process of cleaning up the cattle was continually going on, and was bound to result in an improvement in public health. There was no increase in the number of school-children suffering from malnutrition compared with last year.

The vote was agreed to.

THURSDAY, MAY 9TH.

The London Lock Hospital.

Mr. **Pethick-Lawrence** asked the Minister of Health whether he had now any information to give the House as to the reforms proposed at the London Lock Hospital.

Captain T. J. O'Connor asked the Minister of Health whether, having regard to the damage already done to the careers of the three women dismissed from their posts at the London Lock Hospital, he would state whether the committee of inquiry had exonerated them.—Mr. **Chamberlain** replied: I am glad to be able to add to the statement which I made in the House on April 30th that a conference has, I understand, been held to-day between representatives of the governing body of the hospital and of the former ladies' committee. The object of the conference was to reach agreement both on proposals made by the Board for the future management of the hospital and on the action to be taken with respect to certain former members of the staff. I am not in a position to inform the House of the results of the conference, but I think hon. Members will learn with satisfaction that it has been held, and will regard the Board's action in seeking it as evidence of their desire to promote the harmonious and successful working of the hospital.

Accidents in Coal Industry.

Mr. **Batley** asked the Secretary for Mines the number of miners employed and the number of fatal and non-fatal accidents in the coal industry for the years 1924, 1925, 1927, and 1928, respectively.—Commodore **Douglas King** replied: The figures are as follows:—

Year.	Mines under the Coal Mines Act, 1911.		
	Number of persons employed.	Number of persons killed.	Number of persons disabled for more than three days.
1924 ..	1,230,248	1201	195,423
1925 ..	1,117,828	1136	178,060
1927 ..	1,037,391	1128	173,449
1928 ..	951,632	989	161,790

Cost of Vaccination.

Mr. **Broad** asked the Minister of Health what was the total cost of vaccination from the rates and taxes in England and Wales for the years 1923 to 1928; and the number of persons vaccinated and revaccinated at the cost of the rates during those years.—Mr. **Chamberlain** replied: The particulars required, so far as they are at present available, are given in the following table:—

Year ended Sept. 30th.	Successful Primary vaccinations.	Successful revaccinations.	Total.	Year ended March 31st.	Expenditure of Guardians.	Grants from Exchequer contribution accounts.	Total
					£	£	£
1923	415,549	316,641	732,190	1923	181,172	10,244	191,416
1924	331,522	89,600	421,122	1924	223,924	11,753	235,677
1925	270,755	40,939	311,694	1925	179,027	3,050	182,077
1926	279,721	54,221	333,942	1926	161,889	4,366	166,255
1927	305,005	113,117	418,122	1927	170,728	8,338	179,066

It will be observed that the figures of expenditure and of vaccinations, respectively, refer to different periods and cannot, therefore, be strictly related to one another.

Barking Hospital Sweepstake.

Mr. **Day** asked the Home Secretary whether it was on his instructions that the Derby sweepstake organised in aid of the Barking Hospital Fund had been stopped by the police.—Sir W. **Joynson-Hicks** replied: It having been brought to my notice that the hospital committee had announced to all donors of 3*d.* a grand Derby draw, were sending out tickets for sale, and offering a consolation prize to the seller of most tickets, I had the promoters and the printers of the tickets warned that to proceed in this way was a breach of the law, and I was informed on April 22nd that the scheme had been abandoned.

British Hospitals Association and Radium.

Mr. **Blindell** asked the Minister of Health what response he was sending to the resolution passed at the annual meeting of the British Hospitals Association recently held in London offering the advisory services of the Association to the Ministry and the Radium Subcommittee as to the best and most convenient centres for radium treatment.—Mr. **Chamberlain** replied: This resolution has not yet been formally submitted to me, but I propose to bring its terms to the notice of the bodies through whom the new supply of radium will be administered as soon as they are set up.

Mental Deficiency Report.

Mr. **Robert Morrison** asked the Minister of Health whether he had now decided to publish the adult section of the Mental Deficiency Report; and when it would be available.—Mr. **Chamberlain** replied: The answer is in the affirmative and the report will be published as soon as possible.

Medical News.

University of Cambridge.—At a congregation on May 11th the following degrees were conferred:—

M.B. and B.Chir.—J. L. Franklin.
B.Chir.—*A. B. Connell and C. A. Francis.

* By proxy.

Royal College of Physicians of London.—An extraordinary comitia of the College was held on April 9th, with Sir John Rose Bradford, the President, in the chair.

Dr. Robert Stevenson Aitken, of New Zealand, was admitted to the membership, and the following, who were elected to the Fellowship on April 25th (see The Lancet, May 4th, p. 957), were admitted to the Fellowship:—Dr. R. W. Marsden, Dr. Rupert Waterhouse, Dr. A. Gurney Yates, Dr. K. D. Wilkinson, Dr. T. L. Hardy, Dr. Geoffrey Bourne, Dr. A. C. Roxburgh, Dr. B. T. Parsons-Smith, Prof. A. W. M. Ellis, Dr. Harold Gardiner-Hill, Dr. J. H. Sheldon, Dr. J. M. H. Campbell, Prof. J. H. Dible, Dr. D. H. Paterson, Dr. Crighton Bramwell, Dr. A. F. Tredgold, Dr. Hugh Gainsborough, Dr. A. H. Douthwaite, Dr. Donald Hunter, Prof. H. M. Turnbull, and Prof. Lovatt Evans, F.R.S.

The President presented the report of the committee appointed to consider the desirability of instituting a diploma in obstetrics and gynæcology. The resolution unanimously passed by the committee was as follows:—

> "The committee is of opinion that the institution of a diploma n Obstetrics and Gynæcology, jointly with the Royal College of Surgeons, is desirable, and that it should be referred to the Committee of Management to consider the best method of meeting the broad practical needs of this department of medical science by means of such a diploma."

Dr. T. W. Eden proposed an amendment, seconded by Dr. Russell Andrews, that the question of instituting a diploma in obstetrics and gynæcology should be referred in the first place to a committee of the Obstetric Fellows of the College who should report recommendations to the President. This amendment was put to the vote and was defeated. The original resolution was then adopted.

The President announced that Dr. F. G. D. Drewitt had presented to the College an engraving of the Chelsea Physic Garden—a garden of which Dr. Drewitt had written a very charming history and which had many associations with the College.

The Treasurer proposed that a donation of 100 guineas should be made by the College to the National Radium Fund, and this was agreed to.

The President then dissolved the comitia.

Royal College of Surgeons of England.—At an ordinary meeting of the Council, held on May 9th, with Lord Moynihan, the President, in the chair, Sir George Makins was introduced, and the President presented him with the honorary gold medal of the College, together with a document declaratory of its award, in appreciation of his valuable services to the College, more especially in arranging and describing the series of drawings in the Army Medical War Collection. Prof. W. Blair Bell was also introduced, and, after signing the by-laws and making the required declaration, was admitted a Fellow of the College.

Prof. Charles A. Pannett was elected a member of the Court of Examiners for a period of five years.

The following, nominated by the Canadian Medical Association, were appointed to act as assessors to the examiners at the primary examination for the Fellowship to be held at Toronto on August 6th, 7th, and 9th, for which there are 30 candidates: Prof. J. P. McMurrich and Prof. C. H. Best. Sir Holburt Waring was appointed to go to Toronto in August as visitor to the Primary Fellowship Examination.

An offer by Mr. W. W. Ouless, R.A., to present to the College his portrait of Sir Arthur Keith was accepted with appreciative thanks.

Diplomas of Member were conferred upon 151 candidates (136 men and 15 women) who have passed the requisite examinations and have complied with the by-laws of the College. The names of these candidates are identical with those published in our issues of May 4th and 11th, with the exception that W. F. Skaife received his Membership in April. J. H. Boultbee, Liverpool University, received the diploma of Member, but will not receive the diploma of L.R.C.P. until a later date.

Society of Medical Officers of Health.—The annual general meeting of the Fever Hospital Medical Service Group of this society will be held at the society's house, 1, Upper Montague-street, London, W.C., on Friday, May 24th, at 3 P.M. After the election of officers Dr. W. Mair MacFarlane will open a discussion on the Uses of Scarlet Fever Antitoxin.

Medical Congress at Brussels.—The ninth session of the Journées Médicales de Bruxelles will be held from June 22nd-26th under the presidency of Prof. Henry Coppez. A feature of especial interest in the programme will be a visit to the new Faculty of Medicine at Brussels, which is described as the most complete and best-equipped in Europe. Particulars of the Congress may be had from the secretary-general, Dr. R. Beckers, 62, rue Froissart.

Royal College of Physicians of Edinburgh.—A quarterly meeting of the College was held on May 7th, when Dr. R. A. Fleming, the President, was in the chair.

Dr. Ella Ferrier Pringle and Dr. John Miller Woodburn Morison were introduced and took their seats as Fellows.

Dr. Frederick William Woolrabe, Lieut.-Colonel John Philip Cameron, I.M.S., Dr. Helen May Russell, Major Ambuj Nath Bose, I.M.S., Dr. Andrew Rae Gilchrist, Dr. Matthew Burn, and Dr. David Rutherford Dow were elected to the Fellowship.

The Parkin prize was awarded to Dr. Harold Whitridge Davies. The Freeland Barbour Fellowship was awarded to Dr. John Smith Fraser.

Fellowship of Medicine and Post-Graduate Medical Association.—On Tuesday, May 21st, at 8.30 P.M., Dr. L. S. T. Burrell will give the fifth lecture arranged for the M.R.C.P. course, at 11, Chandos-street, Cavendish-square, W. He will speak on Modern Methods of Diagnosis and Treatment in Pulmonary Tuberculosis. The sixth lecture of the same course, on Tests of Hepatic and Pancreatic Functions, will be delivered by Dr. H. E. Archer on Friday, May 24th, at the same place and hour. Copies of the full syllabus, and tickets of admission may be had from the Secretary of the Fellowship, at 1, Wimpole-street, London, W. 1, together with particulars of other courses and lectures which have been arranged.

University of London Medical Graduates Society.—The annual meeting and May dinner of the society was held at the Langham Hotel on May 7th, the President, Sir StClair Thomson, being in the chair. Medical graduates of the University, he pointed out, numbered over 4000, and there was still scope for an increase in membership. The society, having been formed at the right time, before the actual construction of the University centre had begun, was ready to play its part in the development of the corporate spirit of the University. Sir Charlton Briscoe's proposal to re-elect the president for a second year of office was carried unanimously. On the proposal of Dr. Herbert Tilley, the three vice-presidents, Sir John Rose Bradford, Lord Moynihan, and Dame Mary Scharlieb, were also re-elected. Six new members of council, were elected—viz., Dr. Rhoda Adamson (Leeds), Mr. Harry Platt (Manchester), Dr. Louisa Hamilton, Mr. Victor Bonney, Dr. A. M. H. Gray, and Sir Thomas Horder—completing the number of 18 for which the constitution of the society provides.

Medical Women's Federation.—The annual meeting was held on May 2nd at the Holborn Restaurant, London. The annual report showed a steady increase in the membership. The hon. treasurer stated that the loan funds had proved of great assistance to young practitioners.

The Council held its half-yearly meeting on May 3rd at the London School of Medicine for Women. Dr. Catherine Chisholm was elected president for a second year; Dr. A. E. Sanderson Clow, Dr. Alison Hunter, and Miss L. Martindale, vice-presidents; Dr. Jane Walker, hon. treasurer; and Miss Mabel Ramsay, hon. secretary. Amongst matters discussed was the report of the London University Committee on Co-education of Medical Students. Stress was laid on the fact that there are women medical students in Great Britain and the British Empire who need a school in London where they may receive their medical education on co-educational lines. The report of the Special Committee which gave evidence before the Government Departmental Committee on the Working of the Midwives Acts was adopted. The executive committee was instructed to prepare a list of names of medical women who are doing National Health Insurance work, so that at the next council a standing committee might be appointed and the interests of women panel practitioners better correlated. A vigorous protest was made by council members at the insertion in the *British Medical Journal* of an advertisement for an assistant (medical woman), who was asked to do light household duties in combination with professional work. A discussion took place in regard to the treatment by medical women of cases of venereal disease in hospitals and clinics, and a resolution was adopted urging that the medical officers treating female venereal disease cases, whether in hospital or clinics, should be women medical practitioners where and whenever such practitioners are available.

In the evening a dinner was given by members of council, past and present, to Lady Berry, hon. of the Federation for ten years, on her retirement.

London Rheumatism Clinic.—The following appointments have been made to the honorary visiting medical staff of the Clinic for the Treatment of Rheumatic Diseases, shortly to be opened in London under the auspices of the British Red Cross Society:—M. B. Ray, D.S.O., M.D., late honorary surgeon to the Harrogate Infirmary; F. D. Howitt, M.R.C.P., physician in charge of the physiotherapy and massage departments of the Prince of Wales General Hospital; C. B. Heald, C.B.E., M.R.C.P., physician in charge of the electrotherapeutic department of the Royal Free Hospital; B. S. Nissé, M.R.C.P., clinical assistant at the National Hospital for Diseases of the Heart; and W. S. C. Copeman, M.R.C.P., medical registrar at St. Mary's Hospital.

Chelsea Clinical Society.—The next meeting of this society on Friday, May 24th, is taking the form of a demonstration, organised by Messrs. Kodak, Ltd., illustrating the value of the kinema in relation to modern medicine and surgery by means of films of medical interest. Non-members (male practitioners only) are invited to this demonstration. Members of the society dine together at the Rembrandt Hotel at 7.30 P.M., before the demonstration. Application to one or other of the hon. secretaries, Mr. A. Rugg-Gunn, 49, Harley-street, W. 1, and Mr. L. A. Harwood, 90, Sloane-street, S.W. 1.

Post-graduate Work in Glasgow.—We have received a syllabus from the Glasgow Post-Graduate Medical Association (secretary, Dr. James Carslaw, 9, Woodside-terrace, C. 3) setting out the facilities for post-graduate instruction available in the summer session from June to October. These comprise a general medical course during the last fortnight of August and the first fortnight of September, and the granting of a limited number of clinical assistantships. Full particulars are to be found in the syllabus.

Medical Golfing Society.—The Spring Knock-out Tournament of this society was won by Sir Kenneth Goadby, the runner-up being Mr. O. N. Plummer. The other semi-finalists were Dr. A. Hope Gosse and Mr. Ulysses Williams. The summer meeting of the society will be held on June 20th at Walton Heath, and the Canny Ryall challenge cup for mixed foursomes (with the Ladies Medical Golfing Society) will be played for at Northwood on June 27th.

Commonwealth Fund Fellowship.—This Fund has awarded 24 Fellowships, tenable by British graduates in American Universities for two years, beginning next September. Among the recipients is Mr. E. T. C. Spooner, M.B., of Clare College, Cambridge, who will proceed to Harvard University.

Pharmaceutical Society of Great Britain.—This society announces that the Hanbury medal "for high excellence in the prosecution or promotion of original research in the natural history and chemistry of drugs" has been awarded to Dr. Henry Hurd Rusby, professor of materia medica at Columbia University, New York.

General Lying-in Hospital.—The Sixteenth Annual Post-graduate Week for Midwives will be given at this hospital in York-road, Lambeth, from May 27th–31st.

Invalid Children's Aid Association.—It is hoped that a total of £5000 will be received by this association as a result of the recent loan exhibition at Lansdowne House.

The Prime Minister of the Commonwealth of Australia has asked the Minister of Health to liberate Dame Janet Campbell, the Senior Medical Officer for Maternity and Child Welfare at the Ministry of Health, to proceed to Australia in order to advise the Government on the organisation and development of maternity and child welfare services for the benefit of the several States of the Commonwealth. In view of the special importance of these services in the interests of the Empire as a whole, the Minister has acceded to the request and has agreed to set Dame Janet Campbell free from her official duties in this country for a limited time. She will probably leave England towards the end of July.

Tavistock Clinic for Functional Nervous Disorders.—At the annual meeting of this clinic on May 8th Sir Frederick Willis, who took the chair, spoke of the need for early treatment of mental illness; and Dr. Crichton-Miller, the honorary director, said that there were about 700 patients on the active roll, and that for the fourth time in 18 months the waiting list had had to be closed. He foreshadowed enlargement of the premises if facilities for teaching and research were to be provided, and the hon. treasurer, Mr. D. O. Malcolm, spoke of an extension scheme to cost £10,000. He reported a deficit of £600 on the work of the year.

Messrs. A. Wander, Ltd., have given £10,000 to the Thankoffering Fund for the King's recovery. One-half of this donation is to be applied to the establishment of a scholarship at Westminster Hospital for research into children's diseases.

Dr. Wilhelm Roehl, head of the chemotherapeutic department of the I.G. Farbenindustrie, whose name is closely linked with germanin (Bayer 205) and plasmochin, has died of a septic infection.

Lebanon Hospital for Mental Diseases.—The thirteenth annual meeting of this hospital, which is established near Beyrout, in Syria, will be held at Friends House, Euston-road (opposite Euston Station), London, at 5 P.M., on Tuesday, May 21st. (Tea 4.30 P.M.) Dr. R. Fortescue Fox, late chairman of the General Committee, will preside, and brief accounts of the work at the hospital, illustrated by lantern slides, will be given by speakers who have lately returned from Syria. The secretary's address is 139, Marylebone-road, London, N.W. 1.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

(The Society's House and Library will be closed on Saturday, May 18th, and Monday, May 20th.)

Wednesday, May 22nd.—5 P.M., Comparative Medicine. Election of Officers and Council. Paper: Prof. F. T. G. Hobday: Surgery of the Thorax and Abdomen of Animals. A discussion will follow in which the following have been invited to take part: Mr. Leslie P. Pugh, Mr. F. Chambers, Prof. G. H. Wooldridge, Prof. J. McCunn, Mr. G. Brooke, and Prof. J. G. Wright. Surgery: Members of this Section are specially invited to attend.

Thursday.—8.30 P.M., Urology. Election of Officers and Council. Pathological Evening.

Friday.—4.30 P.M., Disease in Children. (Cases at 4.30 P.M.) Election of Officers and Council. Presidential Address: Dr. F. John Poynton: Some Phases in English Pediatrics as Viewed by a General Physician. Cases will be shown. 8 P.M., Epidemiology. Election of Officers and Council. Paper: Dr. A. Joe: Puerperal Fever. Obstetrics and Gynæcology. Members of this Section are specially invited to attend.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.

Wednesday, May 22nd.—2.30 P.M. (at University College, Gower-street), Quarterly General Meeting. 3.30 P.M., Prof. Charles Spearman: Psychiatric Use of the Methods and Results of Experimental Psychology. (Maudsley Lecture).

MEDICO-LEGAL SOCIETY.

Thursday, May 23rd.—8.30 P.M. (at 11, Chandos-street, W.) Discussion on Acute Arsenical Poisoning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

Monday, May 20th, to Saturday, May 25th.—Medical Society Lecture Room, 11, Chandos-street, Cavendish-square, W., M.R.C.P. Course of Instruction. Lectures on Tuesdays and Fridays at 8.30 P.M. Tues., Dr. L. S. T. Burrell: Modern Methods of Diagnosis and Treatment in Pulmonary Tuberculosis. (This lecture originally dated June 11th is exchanged with Dr. Myers's lecture originally dated May 21st.) Fri., Dr. H. E. Archer: Tests of Hepatic and Pancreatic Functions.—Queen's Hospital for Children, Hackney-road, Bethnal Green. Tues., at 3 P.M., clinical demonstration by Dr. Alice King (Chronic Lung Cases). Free.—St. Peter's Hospital, Henrietta-street, W.C. Wed., at 2 P.M., genito-urinary operation demonstration by Mr. Swift Joly. Free.—Royal Free Hospital, Gray's Inn-road, W.C. Fri., at 5 P.M., lecture-demonstration by Prof. Dame Louise McIlroy. This course consists of a series of lecture-demonstrations continuing until June 7th.—London Lock Hospital, Dean-street, W. Special course of instruction continuing until June 1st.—St. John's Hospital, Leicester-square, W.C. Clinical instruction every afternoon and evening with special lectures on Thurs. and Fri. Proportionate fees for last two weeks.—Maudsley Hospital, Denmark Hill, S.E. Course in psychological medicine. Last week.—Further particulars from the Fellowship of Medicine.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY, 49, Leicester-square, W.C.

Wednesday, May 22nd.—5.30 P.M., Dr. A. M. Memmesheimer (Tübingen): The Skin as an Organ of Protection and Immunity. (Annual Oration.) The annual dinner will be held immediately following the Oration at Kettner's Restaurant.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

TUESDAY, May 21st.—10 A.M., Medical Registrar: Ward Visit. 2 P.M., Mr. Addison: Operations. 2 P.M., Mr. Sinclair: Surgical Out-patients.

WEDNESDAY.—10 A.M., Dr. Owen: Children's Out-patient Department. 2 P.M., Mr. Tyrrell Gray: Operations. 2 P.M., Dr. Scott Pinchin: Medical Out-patients.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 11.30 A.M., Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. MacDonald: Genito-Urinary Out-patient Department.

FRIDAY.—10 A.M., Dr. Pritchard: Medical Ward Visit. 12 noon, Dr. Shaw: *Clinical Demonstration.* 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Children's Medical Out-patient Department. 10 A.M., Resident Assistant Surgeon: Ward Visit. Medical and Surgical Out-patients at 2 P.M., daily. Operations. Special Departments daily, 10 A.M. to 5 P.M., Saturdays 10 A.M. to 1 P.M. Special Classes in Anæsthetics and Operative Surgery.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

WEDNESDAY, May 22nd.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat and Ear Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.

NATIONAL HOSPITAL, Queen-square, Bloomsbury, W.C.

TUESDAY, May 21st.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Adie: The Localisation of Cerebral Tumours (2)

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Riddoch: Blood Vessel Tumours of the Brain.

FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Symonds: Neurosyphilis (1).

ST. THOMAS'S HOSPITAL, Albert Embankment, Westminster Bridge, S.E.

THURSDAY, May 23rd.—5 P.M., Prof. S. J. Cowell: Dietetics. (Fourth of six lectures.)

UNIVERSITY COLLEGE, Gower-street, London.

THURSDAY, May 23rd.—5 P.M., Mr. R. J. Lythgoe: Special Sense Physiology *(Fourth of six lectures.)*

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

THURSDAY, May 23rd.—5 P.M., Dr. J. M. H. MacLeod: Leprosy.

FRIDAY.—5 P.M., Dr. Knowsley Sibley: Alopecia.

UNIVERSITY OF BIRMINGHAM.

THURSDAY, May 23rd.—4 P.M. (In the Medical Lecture Theatre, Edmund-street Buildings), Dr. H. Charles Cameron: Some Types of Septic Infection in the Newly-born. (First Ingleby Lecture.)

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

FRIDAY, May 24th.—3.30 P.M., Dr. Barnes: Graves's Disease.

Appointments.

ALLOTT, H. C. W., L.A.H. Dub., L.R.C.S. Edin., has been appointed Certifying Surgeon under the Factory and Workshop Acts for Wolston, Warwickshire.

TIBBITS, A. C., L.R.C.P. Lond., M.R.C.S., D.P.H., County Medical Officer for Nottinghamshire.

Vacancies.

For further information refer to the advertisement columns.

Aberdeen City.—M.O.H. £1100.

Aberdeen Royal Hospital for Sick Children.—Hon. Asst. Surgeon.

Altrincham General Hospital.—H.S. At rate of £125.

Ashton-under-Lyne District Infirmary.—Hon. Asst. Radiologist.

Birmingham, City Babies Hospital.—Res. M.O. At rate of £150.

Birmingham, City Mental Hospital.—Jun. Asst. M.O. £350.

Birmingham, General Hospital.—Two Res. Surg. Regs. Each £100 to £140.

Blackburn and East Lancashire Royal Infirmary.—Fourth H.S. At rate of £130.

Bolton Infirmary and Dispensary.—Res. Surg. O. £240. H.S. £150. Also Asst. H.S. £100.

Bradford Royal Infirmary.—H.S. £150.

Brighton, Royal Sussex County Hospital.—Cas. H.S. £120. Also H.S. £150.

Bootle Borough Hospital, Derby-road.—Two Jun. M.O.'s. Each at rate of £125.

Burnley, Victoria Hospital.—H.S. At rate of £125.

Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.

City of London Hospital for Diseases of the Heart, &c., Victoria Park, E.—H.P. At rate of £100.

Coventry and Warwickshire Hospital.—Res. H.S. £125.

Dudley, Guest Hospital and Eye Infirmary.—H.S. and Asst. H.S. £175 and £150 respectively.

Elizabeth Garrett Anderson Hospital, 144, Euston-road, N.W.—H.P., Obstetric Asst. and Three H.S.'s. Each at rate of £50.

Hertford County Hospital.—Hon. Surgeon.

Holborn and Finsbury Hospital, Archway-road, N.—Second Asst. M.O. £300.

Hospital for Epilepsy and Paralysis, Maida Vale, W.—Med. Reg. £100.

Hospital for Sick Children, Great Ormond-street, W.C.—H.S. and H.P. Each at rate of £100. Also Res. M.O. for Country Branch, Tadworth, Surrey. At rate of £250.

Hove Hospital, Sackville-road.—Res. M.O. £150.

Kensington, Fulham and Chelsea General Hospital, 194, Finborough-road, S.W.—Hon. Radiologist.

Leamington Spa, Warneford General Hospital.—Res. H.P. Also Res. H.S. Each £165.

Leeds Public Dispensary.—Jun. Res. M.O. £150.

Liverpool County Borough.—Jun. Asst. M.O. £600.

L.C.C. Mental Hospitals Service.—Eighth Asst. M.O. £300.

Lowestoft and North Suffolk Hospital.—H.S. £120.

Male Lock Hospital, 91, Dean-street, W.—H.S. At rate of £200.

Manchester, Ancoats Hospital.—H.S. At rate of £100.

Manchester Northern Hospital for Women, &c.—Sen. H.S. Also Jun. H.S. At rate of £130 and £100 respectively.

Manchester Victoria Memorial Jewish Hospital, Cheetham.—Hon. Phys.

Manor House Hospital, Golders Green, N.W.—Jun. H.S. At rate of £200.

Margate Royal Sea-Bathing Hospital.—H.S. At rate of £100. Also Asst. Med. Supt. £500.

Middlesex County Council.—Asst. Dental Officer. £500.

Middlesex Hospital, Middlesex School, W.—Second Demonstrator for Department of Physiology. £200.

Northampton General Hospital.—Hon. Anæsthetist.

Norwich, City of.—Asst. M.O., &c. £450.

Nottingham, General Hospital.—Res. Cas. O. At rate of £200.

Oxford, Radcliffe Infirmary and County Hospital.—Hon. Asst. Physician to Dermatological Department.

Portsmouth Royal Hospital.—Sen. H.S. Also H.S. At rate of £175 and £130 respectively.

Queen's Hospital for Children, Hackney-road, E.—Cas. O. H.P. Also H.S. Each at rate of £100.

Royal Free Hospital, Gray's Inn-road, W.C.—Asst. M.O. for V.D. Clinic. £500. H.P.'s and H.S.'s. Also Obstetric District Asst. £100. Cas. O. £150.

Royal London Ophthalmic Hospital, City-road, E.C.—Out-patient Officer. £100.

St. Albans, Napsbury Mental Hospital.—Jun. Asst. M.O. £485.

St. Peter's Hospital for Stone, Henrietta-street, Covent Garden, W.C. Clinical Pathologist. £250.

Salford City Infectious Diseases Hospital.—Jun. Asst. Res. M.O. £200.

Samaritan Free Hospital for Women, Marylebone-road, N.W.—Additional Anæsthetist. £30.

Sheffield Royal Hospital.—Residents for temporary duty. At rate of £80.

Shrewsbury Eye, Ear and Throat Hospital.—H.S. £200.

South London Hospital for Women, South Side, Clapham Common, S.W.—Asst. Phys.

Stafford, Staffordshire General Hospital.—Hon. Surgeon.

Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S. £150. H.S. for Ophthalmic and Aural Departments. £150. Also Asst. H.P. £125.

Swansea Hospital.—H.S. £150.

Taunton and Somerset Hospital.—Jun. House M.O. At rate of £100.

Tunbridge Wells and Counties General Hospital.—H.S. £160.

Walsall General Hospital.—H.S. Also Jun. H.S. At rate of £125 and £100 respectively. Also Hon. Consultant Surgeon and Hon. Consultant Physician.

Wigan Infirmary.—Third H.S. At rate of £150.

Will Edmonds Clinical Research Fund.—Fellowship. £500.

Willesden General Hospital, N.W.—Registrars.

Windsor, King Edward VII Hospital.—Sen. and Jun. H.S.'s. At rate of £120 and £100 respectively.

Wolverhampton Poor-law Institution and Hospital.—Asst. Res. M.O. £250.

Workmen's Compensation Act.—Two Medical Practitioners, on Medical Board for Silicosis.

Zetland, County of.—School Medical Officer, &c. £700.

Births, Marriages, and Deaths.

BIRTHS.

ANDREWS.—On April 30th, at 41, Harley-street, W., to Helen and John Alban Andrews, M.C., F.R.C.S.,—a daughter.

BILLINGTON.—On May 9th, at Woodbridge, the wife of Dr. C. M. Billington, of a daughter.

CHILDS.—On May 6th, at Chalbury Lodge, Burnham-on-Sea, the wife of Dr. Reginald Childs, of a son.

DEATHS.

CHEATLE.—On May 11th, in London, Arthur Henry Cheatle, C.B.E., F.R.C.S., aged 62 years.

KEELE.—On May 9th, at Langford-place, St. John's Wood, Charles Ferdinand Keele, M.R.C.S. Eng., L.R.C.P., aged 88 years.

KENNY.—On May 11th, at The Avenue, Clifton, York, Major-General William Wallace Kenny, C.B., late A.M.S., aged 75 years.

SIDEBOTHAM.—On May 9th (Ascension Day), at his residence, Erlesdene, Bowdon, Cheshire, Edward John Sidebotham, M.A., M.B., aged 68 years.

THACKER.—On May 4th, at Nice, Cecil Robert Allen Thacker, M.A., M.D., late Fellow of Sidney Sussex College, Cambridge, aged 39 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices o Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

TREATMENT OF HÆMORRHOIDS BY INJECTION.

DR. V. J. BELLOT, Surgeon-Captain in the French Navy, reports at length in the *Archives de Médecine Navales* (1928, cxviii., 237) on the treatment of hæmorrhoids by injection, as he has practised it in the Naval Hospital at Cherbourg during the last five years. The solution he injects, drop by drop, into the pile contains 0·8 g. quinine hydrochloride and 0·4 g. urethane in 2 c.cm. of normal saline. He has done 150 cases without a failure and declares the method satisfactory alike to patients and surgeon, for it causes really no discomfort, the cure is complete, and in the most successful cases the piles are sclerosed without any more trouble.

His patients, being service people, were mostly treated in hospital. The operation, he says, should not be done when the piles are inflamed. Once that crisis has been got over and the diagnosis has been settled the patient is purged; next morning he gets an opium pill, and the operation area is shaved and sterilised with weak iodine. On the table, a cupping glass is chosen appropriate in size, and is exhausted and applied to bring down the internal piles and to swell up the external; this is the only part of the procedure that is at all painful. After further cleansing the surgeon takes in his right hand a 2 c.cm. glass syringe with its plunger graduated in minims and with a short (1 cm.) fine and very sharp needle. He then proceeds to puncture every hæmorrhoid, tag, or suspicious area, and injects single minims of the solution at each puncture, 1 cm. below the surface, the punctures being made at a distance of 1 cm. from each other, and the sphincter area being avoided. There is no need, Bellot says, to see blood in the syringe; hæmorrhage is unimportant; the drop is to be expressed steadily, but not as the needle is being withdrawn. A swab held in the left hand takes up excess solution to prevent irritation of the mucous membrane.

The area is dressed with ointment on gauze which wraps an india-rubber tube; this is left in position in the anus until the first stool, delayed by a daily opium pill, is allowed to pass, generally on the fourth day. From the moment of injection there is at once relief from pain and discomfort; the patient is no longer troubled by his anus; his injected hæmorrhoids sclerose, and often he is well enough to leave hospital on the fifth day. In more than half the cases a slough forms, as always happens, he says, after treatment by ligature or thermo-cautery. After injection, however, the slough separates easily and quickly, and the patient is probably well in three weeks, and this quite without discomfort, even in defæcation.

Cures of fissure by this method are mentioned, also of piles for an old man who could not have stood the usual operation, and two cases of prolapse were successfully dealt with. The number of patients applying to the hospital for treatment of hæmorrhoids is four times what it was before treatment by injection was introduced, and all so treated are said to have been satisfied, especially those who had experienced earlier methods. Bellot claims that he has had no failure, and those he has undertaken as ambulant cases—treated as he observes, with smaller doses—have recovered completely and without sloughing. He discusses the reports of Bensaude, Terrel, and others, and their alternative procedures, but concludes that his aim, to get men cured at a single operation and without discomfort, has been successfully attained. He therefore advises others to give this method a trial.

HAIR DYES AND THEIR APPLICATION.

THE ideal hair dye must be harmless, permanent, of a natural appearance, reproducing every possible shade, and must be unaffected by such procedures as those adopted for permanently waving the hair. So far as colour is concerned, the most satisfactory results are obtained from the coal tar dyes, but unfortunately they are all dangerous. The vegetable dyes are useful and harmless, but do not give a sufficient range, and are more difficult to apply.

An elaborate treatise[1] on the subject has recently been published. It contains a description of the hair dyes and bleaching agents, the technique which should be employed in connexion with each of them, and the risks attendant on their use. It is meant to be a practical guide to the hairdresser and the chemist, but cannot but be of interest to physicians, especially dermatologists, who are liable to be consulted, not only as to the advisability of dyeing the hair, but also with regard to the consequences. Beginning with a brief consideration of the structure and pigment of the hair, it goes on to discuss the important problems of hair-dyeing in relation to the structure of the hair itself. It is pointed out that, for the dye to be permanent, the reagents employed should be capable of passing between the overlapping scales of the cuticle into the hair cortex, and that an important factor in preventing this penetration is an excess of sebum. Consequently, before any dye is used, it is necessary that all grease and sebum should be removed by cleansers. Experience has shown that the easiest form of hair to dye is that which is straight rather than curly or wavy, and of normal texture rather than very fine or very coarse.

The dyes in common use are divided into metallic dyes, such as lead, silver, copper; vegetable dyes, such as walnut juice, henna, and indigo; and dyes of the coal tar series, which frequently contain paraphenylendiamine. Of these there is a considerable number, but none of them is quite satisfactory, and the ideal hair dye has yet to be discovered. This is especially true where a black or dark brown tint is desired. The problem of dyeing grey hair black still remains unsolved.

The technique of hair-dyeing is here described in detail. Various preliminary precautions of a practical nature are insisted upon, such as the thorough examination of the scalp to ascertain whether it is healthy and not affected by some form of dermatitis, which might be aggravated by the dye; and, where the paraphenylendiamine dyes are employed, the previous use of the Sabouraud-Rousseau test is advocated. This test consists of applying a small quantity of the dye to a patch of skin behind the ear, in order to ascertain the existence of any idiosyncrasy on the part of the individual skin to the dye. Should a severe reaction occur, the employment of such dyes is negatived.

AN APPEAL.

To the Editor of THE LANCET.

SIR,—I am interested in the case of a man who has lost his leg, but who by the use of an elaborate and expensive artificial limb has been able to obtain well-paid work. The limb is worn out but can be replaced through the kind offices of the Royal Surgical Aid Society by another one. But 140 letters are required to this end. Of these through the man's own exertions, 61 have been forthcoming, and 44 have been received through the Editor of THE LANCET. I am hoping, Sir, that you will let me publish this appeal for the residue and will allow me to indicate to those who are able to help that you will accept the letters on behalf of a case, the details of which you know.

I am, Sir, yours faithfully,
May 14th, 1929. Q.

*** The case is a thoroughly deserving one. It seems that the man must join the ranks of the unemployed unless he can obtain the limb promptly, and any R.S.A.S. letters sent here filled in with the name "H. Hankins" will be gratefully received.—ED. L.

DALRYMPLE HOUSE.

THIS valuable institution for the cure of inebriation and drug addiction has just issued its forty-fifth annual report. In 1928 it admitted 71 patients, five under the Inebriates Act and 66 private. All but four were cases of alcoholic excess. Of three suffering from delirium tremens, two recovered and one died. The remainder, except for two insane patients, one who died from diphtheria, and a fourth discharged to hospital with apoplexy, rapidly recovered and have remained in good health, an admirable result. Several patients have been readmitted, the cause being usually over-confidence and the hope that drink in moderation, or the avoidance of spirits, will do no harm. The superintendent, Dr. F. S. D. Hogg, repeats in his report the constant warning that the only hope of permanent cure for all but a negligible percentage lies in total abstinence. Of the four drug addicts two were cured, one left on private business and the other died of myeloid leukæmia. The average length of stay among private patients was seven weeks, excluding two patients who had elected to remain after their cure was complete. The report contains detailed statistics of patients discharged, and a number of views of the house and grounds; it testifies to the good work which this home is performing and the efficiency of its methods.

MEMORIAL TO A SURGEON.—A sum of 1000 guineas has been subscribed to found a bed in the children's ward of the new Northern Infirmary at Inverness in memory of the late Mr. James Luke, who was surgeon to the infirmary for 21 years.

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[1] Blonde or Brunette. By H. Stanley Redgrove, B.Sc., A.I.C., and Gilbert A. Foan. Pp. 182. London: William Heinemann (Medical Books), Ltd. 7*s.* 6*d.*

An Address

ON

CANCER OF THE COLON.

Being the Annual Oration of the Medical Society of London, delivered on May 13th, 1929,

BY G. GREY TURNER, F.R.C.S. ENG.,
SURGEON TO THE ROYAL INFIRMARY, NEWCASTLE-UPON-TYNE;
PROFESSOR OF SURGERY IN THE UNIVERSITY OF DURHAM.

(*Concluded from page 1023.*)

THE ACTUAL MANAGEMENT OF CASES.

I hope I have already clearly shown that in my experience cases do best, and make the easiest recovery, in which there has been a preliminary drainage of the large bowel, usually by opening the cæcum. The advantages of this preliminary cæcostomy are that:—

1. It relieves obstruction, whether acute, partial, or potential.
2. It relieves the recurring distension of the colon by gas, which is so apt to occur in cases where the function of the great bowel has for some time been interfered with.
3. It allows the bowel to recover from the effect of obstruction of any degree, both as regards infection and muscle tone.
4. It permits the great bowel to empty, not necessarily entirely through the cæcostomy, but by relieving the disturbed function and by allowing relaxation of its wall.
5. It permits of irrigation of the bowel, either from the anus to the cæcostomy, or vice versa.
6. It relieves pain and enables the patient to get natural sleep and to assimilate nourishment.

Many surgeons, recognising the advantages of drainage, have sought to extend it to cases without obstruction by combining a safety-valve cæcostomy with the one-stage operation of excision. This is a plan which I also have carried out from time to time, but I do not consider it nearly so satisfactory as the preliminary drainage. If the opening into the cæcum is going to be reliable, its function as a by-pass ought to be established, and unless there is considerable tension in the bowel this cannot be expected to occur at once. I know that an opening made at the time of the resection has often sufficed, but I do want to urge that when there is the least doubt, it is much wiser to make it some days earlier.

Even in the presence of obstruction, a cæcostomy is not always efficient. I do not imagine that it will ever fail to relieve the immediate symptoms of obstruction, but quite often the bowel does not completely empty, and does not recover its normal size and tone. In these circumstances the surgeon may find an enlarged fæcal soiled, sodden, and infected intestine, even some two or three weeks after the cæcum has been opened. For these reasons a preliminary colostomy is sometimes more valuable.

If a cæcostomy functions satisfactorily and relieves the mechanical symptoms and, in spite of this, the patient does not pick up, a search must be made for the cause. Either there is unsuspected dissemination which may be suggested by a slight degree of jaundice, or there are fæcal ulcers in the bowel with localised peritonitis, or there is absorption from a sloughing growth, or from an abscess in association with the growth. All these conditions, except dissemination, are indications for a further operation rather than for waiting. This brings us to the consideration of the proper interval that should elapse between the cæcostomy and the next stage.

This depends upon the progress which is made. As long as the patient is really improving, then it seems prudent to wait. If progress hesitates after the mechanical obstruction is relieved by satisfactory drainage, then it does not seem wiser to delay for longer than two weeks because the stabilisation of the fistula will have occurred by that time, and want of recovery will be due to one of the other conditions which have been mentioned, and which are not likely to improve by further waiting.

During this period irrigation of the bowel can be carried out from the rectum and through the cæcostomy, although the former is likely to be the more successful. If this is not immediately successful, it should be repeated, and it is quite extraordinary how on one occasion fluid passed into the rectum will find its way through what subsequently proves to be a tiny channel in the growth, while on another occasion nothing can be made to traverse the intestinal canal. It does not appear that antiseptic irrigation is any more useful than irrigation by saline solution, which acts purely mechanically. It is important to give at least one dose of purgative medicine to make sure that the small bowel is thoroughly emptied, but repeated purgation in the presence of a patent cæcostomy seems to have no effect on the large bowel and is unnecessary.

The interval between the cæcostomy and the second operation should be used for endeavouring to locate the exact situation of the growth. Where this can be done it is possible that exposure to X rays or to radium emanation may be valuable, but these are methods which I have not employed, and they only occur to me as refinements which may become the established practice in the not very distant future.

A difficult class of case is the patient who arrives with a mild degree of obstruction. The symptoms are not very marked and the abdomen is not distended; in other words, there is nothing to determine that only a blind cæcostomy should be carried out. In these circumstances the best results will follow if the surgeon will open the abdomen and determine the situation and extent of the growth, with a view to its subsequent removal. Having made this investigation and determined that resection is likely to be feasible, he should do a preliminary cæcostomy or colostomy and remove the growth at a subsequent operation. If, on the other hand, the growth is clearly irremovable, or is on the borderline, then it may be wise to make a lateral anastomosis which will suffice to relieve the condition as far as possible. Sometimes I have made such an anastomosis with the intention that if the patient made an extremely good immediate recovery, then I would reopen the abdomen by direct incision over the growth, and endeavour to remove it. Such efforts have not infrequently been rewarded, and I want to refer you to a growth in the neighbourhood of the splenic flexure which, at such an operation, I found to be involving the upper jejunum, together with a portion of the stomach.

At the first operation a lateral anastomosis was made between the proximal colon and the sigmoid. During the fortnight that followed the patient made such unexpectedly good progress that I reopened the abdomen and excised the mass of growth, together with the loop of jejunum and a complete section of the stomach (Fig. 4). The patient is now, more than two years afterwards, in excellent health, having gained 2 st. in weight, and is able to follow his occupation regularly.

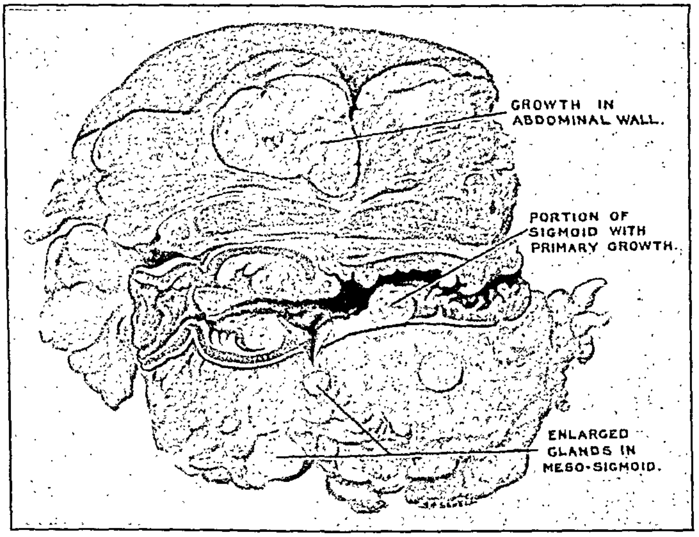
This seems a proper place to indicate the sort of preliminary investigation that must be made when the abdomen is opened. It includes first an examination of the liver for secondary deposits, and if these are absolutely definite, then I scarcely think that it is ever worth while to do more than a palliative anastomosis. At the same time I would not be easily deterred, for sometimes a simple mass in the liver may simulate a secondary deposit, and subsequent investigation, or the future history of the patient, has more than once shown that such a single mass has been an adenoma, an angioma, or an old inflammatory condition. I should much rather do what may prove to be an unnecessary resection than deny a single patient the great advantages of the removal of a malignant growth because of the fear that some indefinite lump in the liver may after all turn out to be a secondary deposit.

It is next important to examine carefully the neighbourhood of the growth for such extension as might render a radical operation unwise; especially the presence of secondary outlying nodules on the peritoneum—one of the worst of all types of dissemination.

The glands in the neighbourhood of the growth should then be carefully examined. Masses of glands close up to the growth need not be a deterrent, but a chain of glands extending far from the growth, though they need not prevent a resection being carried out, are certainly of evil omen. Sometimes a single mass of glands may be found at some distance from the growth. Under these circumstances the growth may safely be removed, and an anastomosis made, and the glands dealt with either then or subsequently by the insertion of radium. I see that my friend Mr. Clogg, confronted with such an eventuality, operated a second time and removed the glands, but this opportunity cannot often arise.

Cases in which the growth is adherent to the abdominal wall are sometimes unpromising, but such an invasion need not prevent successful removal, and I want to bring before your notice two patients in which this infiltration was of very great extent. Minor degrees of fixation to the muscles of the abdominal parietes are not infrequent, and can usually easily be dealt with, but in the patients that I have in mind the whole thickness of the abdominal wall was infiltrated, so that in both the growth made a very definite and obvious mass on the surface. In both I was able to excise the involved area of the abdominal wall, and to make a satisfactory excision of the adherent bowel. In the first case, Fig. 2, where a portion of small intestine had also to be removed, the patient is alive and free from recurrence now nine years after operation, and in the second, Figs. 5B and 6, the patient is extremely well, though more than four years have elapsed since the operation was carried out.

FIG. 6.

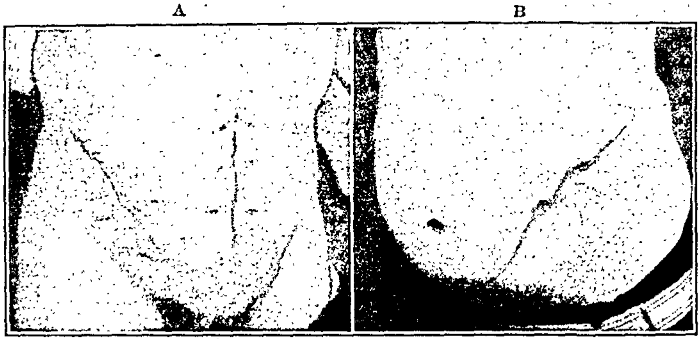

GROWTH IN ABDOMINAL WALL.
PORTION OF SIGMOID WITH PRIMARY GROWTH.
ENLARGED GLANDS IN MESO-SIGMOID.

The specimen referred to in Fig. 5B. (Case 14 in list of multiple resections.)

THE INCISION.

Having determined, by the preoperative examination, or by preliminary exploration, the situation of the growth, the selection of the optimum incision is a matter of great importance. Mobile growths in a mobile colon may be easily removed through a median or paramedian incision, but very adherent growths in the cæcal region, the hepatic or splenic flexure, or the descending colon or commencement of the sigmoid cannot be satisfactorily dealt with by this route. It is to meet these circumstances that I strongly advocate direct exposure over the situation of the growth, using the oblique or transverse muscle-cutting incisions of Rutherford Morison (Fig. 5).

FIG. 5.



To show the oblique muscle-cutting incisions employed for dealing with adherent growths. In A the growth was at the hepatic flexure. It could not be successfully mobilised from the median incision. Through the oblique incision the cæcum with an open cæcostomy and the growth were easily removed. In B the growth was in the sigmoid and had invaded a considerable area of the whole thickness of the abdominal wall. This was removed with the growth and an end-to-end union established. The specimen is shown in Fig. 6. The patient, a man of 64, is alive and well nearly five years afterwards.

If the surgeon first makes a median incision and finds that a growth favourable for removal because of the absence of dissemination is yet so fixed as to be inaccessible, he must not hesitate to make a second independent incision over the growth or he must make a cross-cut from his original one (Fig. 7A).

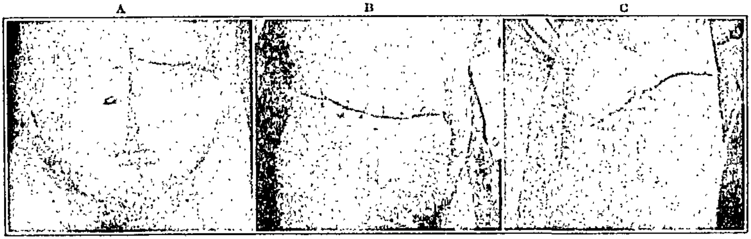
MOBILISATION.

Fixation of the growth, in the great majority of cases, is not due to malignant infiltration, but to an exaggeration of the fixation of those parts of the large bowel which has been so frequently described in the literature that has sprung up around the subject of intestinal stasis. The sort of adhesions which are responsible for the first and last kinks of Sir William Arbuthnot Lane may be congenital or they may be inflammatory, but in either case, in the presence of some localised lesion, like a bowel growth, they become much more definite and are sufficient to produce such a degree of fixation as to lead to the impression that such want of mobility is due to extension of the malignant growth. It is very rarely that the fixation to which I now refer cannot be dealt with by local interference, but unless the scissors can be freely used under the guidance of the eye it may be very baffling. It is for this reason that I consider that the operability of quite a proportion of the growths which we are now considering depends on the access which the parietal incision allows, and this is why I so strongly advocate an approach directly over the growth, rather than the traditional incision in the neighbourhood of the middle line.

The kind of fixation which is due to extension of the growth to neighbouring parts by contiguity, if it occurs on the mesenteric side, may well debar successful removal, but fortuitously it often arises away from the mesentery, and in these circumstances the extensions of the growth can often be successfully removed. I have many times cut away portions of the parietes, or an area of the peritoneum, transversalis fascia, or iliac fasciæ, or sometimes a complete section of the abdominal wall (Fig. 5B). As is shown in the list of cases of multiple excisions this sort of extension has sometimes meant the sacrifice of some part of the other viscera, and I have several times, for this reason, removed the appendages or the uterus in the female, a portion of the bladder; or a loop of small intestine; and twice a complete section of the stomach. Sometimes a slice of the stomach or duodenum, or a part of the margin of the liver has sufficed. Some of my patients who have been subjected to these extensive operations are alive and in good health several years after the operation (Fig. 8).

Separation of adhesions and the measures necessary for dealing with such extensions as I have described may mean that the mobilisation is itself a formidable matter, and I would urge the need of taking care to deal with the hæmorrhage that may occur, for I have certainly once lost a patient as the result of hæmorrhage, and possibly on other occasions such bleeding may have contributed to an unfortunate result.

FIG. 7.



A shows the incisions employed for the removal of an adherent growth of the splenic flexure. To enable mobilisation to be carried out the cross cut through the rectus had to be employed. The patient was operated upon by Paul's method and is alive and well ten years afterwards. B shows the incision used for the removal of an adherent growth of the ascending colon with many glands. The bowel from the lower ileum to the middle of the transverse colon was excised. C shows a similar incision employed for an adherent growth of the descending colon. An exploration was previously carried out through the median incision. Both B and C are recent cases.

CONDUCT OF THE RESECTION.

The actual operation of excision of a portion of the colon is seldom like the pictures one sees in works on surgery. I do not wish to say anything disparaging about the many beautiful and sometimes excellent illustrations that appear in text-books, but I do want to emphasise the very great difficulty of correctly depicting abdominal surgical procedures. I speak feelingly on this matter, because I have tried very hard to represent exactly and accurately what actually occurs, but it is extraordinarily difficult. In most books the clamps figure much too largely. I do not understand the necessity for crushing the ends of the bowel, and for my own part I am content to use clamps which merely temporarily occlude the bowel until the suturing of the ends is carefully carried out. Nor do I understand the wisdom of dividing the bowel with the cautery. No surgeon would elect to cut the bowel so near the growth as to make the use of the cautery necessary for the destruction of malignant tissue in the cut margin, but I do think that the cautery is valuable in these operations. Its usefulness is in the division of the mesentery in the neighbourhood of the lymphatics, or in those situations where the surgeon has not been able to get very far away from what is possibly an infected gland for the application of his ligatures. Under these circumstances the use of the cautery seems rational.

I have no confidence in those operations which have been proposed for the carrying out of so-called aseptic intestinal anastomosis. I have little fear of septic contamination from the contents of the bowel or its mucous surface, and I feel that if my cases have not done well it has not been because septic contamination has occurred at the time of operation. As a rule, if an anastomosis has failed there has been some fault connected with the blood-supply, or the patient has suffered from sepsis that has arisen from the sodden infected condition of the bowel and not from the exposed cut surface at the operation itself. I am at liberty to mention that Prof. John Fraser, of Edinburgh, who, with Mr. Norman Dott, was responsible for the introduction of an ingenious guillotine method of aseptic anastomosis, has himself largely given up the plan because he has found that, in the human subject at all events, it has not proved sufficiently successful.

The question often arises as to whether the anastomosis should be made by the end-to-end or the side-to-side method. This is a matter which may be safely left in the hands of the experienced surgeon, but others may welcome some guidance. Personally, I was brought up to rely on the lateral method, but I have been gradually converted to the end-to-end plan, and for the following reasons: the latter requires much less bowel, so that in a case in which it may be forseen that it will be difficult to get the ends together, more bowel can be sacrificed without jeopardising the success of the union than could be taken away if enough had to be left to make a satisfactory side-to-side anastomosis. There is much less suturing to carry out, and much less suturing to go wrong. There are no blind ends; blind ends which I have twice seen give way, and lead to a fæcal fistula, one of which required a secondary operation, and which I have no doubt on other occasions have leaked with more disastrous consequences. The end-to-end method is quicker, and this is of some moment, because it means that more time can be spent on the more important step of free mobilisation. Further, there is no temptation to scamp the suture line, and, lastly, the end-to-end union is certainly the more natural. But one freely admits that one method will not necessarily fulfil all the multitudinous indications that may arise. The surgeon should be conservative in his tastes but catholic in his methods, and should be prepared at all times to adopt any particular method that may fulfil a special indication.

This matter is often dismissed by saying that the operative measures are now sufficiently standardised. Since neither the human body nor pathological processes are standardised, I am fearful of "standardised operations." However much it may be desirable to follow some preconceived plan, the conditions found on opening the abdomen may quite preclude the possibility. In this connexion I would point out that in many of the successful cases in my series it was not possible to carry out the removal of such an amount of bowel or mesentery as would bring the operation within the accepted text-book descriptions. If the cases which I have related have convinced any of you that a lesser operation will sometimes suffice it will be some satisfaction to me.

In making the anastomosis the following are the principles which have guided me.

It must be possible to approximate the bowel ends without the least tension, and they must be able to lie in comfortable proximity before any sutures are used. The blood-supply of every part of the circumference of the cut ends must be assured. The margins of the bowel ends must be plainly seen. A water-tight junction must first be secured by through-and-through sutures, which must also arrest hæmorrhage. The first line of sutures must be buried by a peritoneal stitch which does not strangulate any of the visible blood-vessels. The line of union must be reinforced by suturing over it any of the neighbouring appendices epiplocіæ or other available tissue.

I am frightened of any method which aims at simplifying the anastomosis at the expense of any of these principles, and am suspicious of all methods which savour of sleight of hand. There is no need to hurry so important a matter, and it demands time and care for its satisfactory completion. Clamps are a convenience, not a necessity, and they must never be so strong as to crush the bowel wall.

The exact site at which it is safe to make the anastomosis must be judged by a consideration of its anatomy, its proximity to the growth, and the blood-supply. So far as the latter is concerned, I am not content to be guided by any preconceived notions as to what the blood-supply ought to be in any particular segment of the large bowel, but I make it a practice to determine by inspection and by palpation, if necessary after the clamps are loosened, that there is a sufficient blood-supply right up to the cut margin. I would like to say once again that I feel satisfied that failures to unite are usually due to starvation of the edge, caused by insufficient blood-supply, and are not entirely dependent upon infection.

PROVISION FOR DRAINAGE FROM THE SITE OF THE ANASTOMOSIS.

When the growth has been large, having a big, raw area as its bed, or has been associated with recent inflammatory disturbance, as shown by surrounding œdema, or when there is any question about the integrity of the blood-supply or the adequacy of the suturing, then will the surgeon be wise to bring a rubber strand or softened drainage-tube from the neighbourhood by the shortest route to the surface. Many times such a drain has saved a disaster for small fæcal leaks have sometimes occurred after great care has been expended at the operation. In every case such leaks have healed spontaneously.

SOME SPECIAL DIFFICULTIES.

Though most difficulties disappear with adequate exposure and mobilisation, others are due to the obesity of the subject or the situation of the growth. When there is a great deal of fat surrounding the colon the difficulties are anatomical rather than pathological, but they may prove extreme. In such cases I find it helpful to divide the layers of the mesentery, so that the vessels may be clearly seen before they are caught or surrounded by ligature. If this step is not taken they have an unhappy knack of retracting amongst the slippery fat where they are difficult to catch, and where they quickly form large hæmatomas. It is also often difficult to catch up the bowel wall for the purpose of suturing, and it is wise to separate the fat from the line of section, so that the bowel wall is clearly seen and can be safely sutured. The tags of fat which have been left are invaluable as a means of providing a local covering when used in the form of a series of grafts over the suture line.

Low sigmoid growths are very troublesome, and the surgeon has often difficulty in deciding whether or not it is wise to remove the growth and, having done so, whether to leave the patient with a permanent colotomy or attempt to make an anastomosis. I would at once say that in these cases I never contemplate an immediate anastomosis unless the patient has the advantage of a previous cæcostomy or colostomy, but with that advantage it is possible every now and again to make a successful union, although the suturing has to be done almost flush with the pelvic floor. To facilitate the removal I have found that it is best to incise the pelvic peritoneum all round half an inch away from the bowel, and by blunt stripping to separate the fat while the bowel is gently drawn upon, so that what is really a portion of the rectum is pulled up into the peritoneal cavity. A clamp is applied to the latter or it is divided without clamps, and drawn up by catch forceps, so that the sutures may be applied. After the latter have been tied, the rectum, with the suture line, retracts into the cellular tissue of the pelvis. The peritoneum, which has been previously separated, then naturally falls into position around the bowel, and can be attached by a few points of suture at a higher level than the anastomosis, in that way providing an efficient protection. In these circumstances the peritoneum must not be closely sutured around the bowel, and a drain from the neighbourhood of the anastomosis must be brought up through the parietal incision. In many of these cases, instead of endeavouring to make an anastomosis at the time that the growth is removed, the lower end of the bowel is tucked in, and the upper end brought out as a colotomy. Whichever method is adopted a large, well-oiled rubber tube must be passed from the anus into the rectum, and kept there for some days. Even when the section has to be made so close below the growth that no bowel is available for an anastomosis, the outlook is not necessarily hopeless, and I have several patients alive and well after long periods in whom these conditions have pertained.

On three occasions I have subsequently restored the continuity of the bowel by a method which is referred to by Kelly in his book on "Operative Gynæcology." The intussusception method of Rutherford Morison was devised for this class of case. It is an operation which is highly ingenious in its conception, but in actual practice I have found it difficult and uncertain and very disappointing in its results, and though it may occasionally be used it has no wide field of application.

PERITONITIS AND ABSCESSES AS COMPLICATIONS OF GROWTHS OF THE BOWEL.

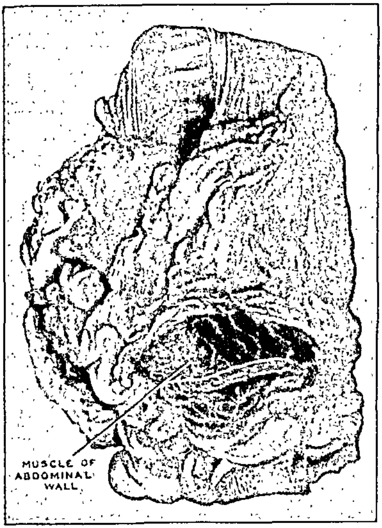
Every now and again the surgeon is confronted with a case in which a bowel growth has suddenly leaked into the peritoneum and the patient has to be operated upon as an emergency. Under these circumstances the condition is sufficiently desperate, but it need not necessarily be hopeless. In this series cases of the kind have been met with and some have been successfully overcome. Sometimes the growth has been withdrawn from the abdomen and left outside while the peritoneum and the bowel have both been drained. In others the hole in the growth has been patched by stitching omentum over it, or by stitching it to a neighbouring viscus. Or the leaking area has been brought directly to the surface through a suitable incision, and in all of these cases cæcostomy or colostomy has been performed and the peritoneum drained. In one such case a ruptured fæcal ulcer in the cæcum was used to make an anastomosis to the descending colon, the patient surviving for a sufficient length of time to justify this makeshift.

Sometimes there is peritonitis, which has arisen as a result of an infection through the wall of a growth but without an actual rupture. In these cases drainage of the peritoneum and of the bowel have similarly tided the patients over the emergency, and secondary resection operations have been successfully carried out. In fact, in these cases I believe that the patients are peculiarly resistent and will tolerate an amount of subsequent interference which in other circumstances might be ill-borne.

A definite localised abscess round a growth is another complication which occasionally first draws attention to the presence of a bowel growth, and years ago I recorded two cases (*Edinburgh Medical Journal*, December, 1909), and since that time have come across other instances—seven in all. In dealing with this complication it is probably wisest first to drain the abscess, and at a second stage to deal with the growth. I say this with some heart-searching, because I have once or twice made the mistake of carrying out the complete operation at one sitting, when I feel that had the two-stage operation been adopted the patient could quite safely have been tided over the ordeal.

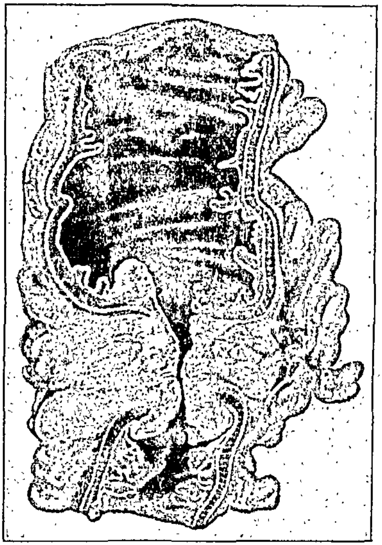
Doubtless many further improvements will be brought about in the treatment of these cases. At the time of the discussion in these rooms in 1920 nearly all the speakers bore witness to the enormous benefit which had followed the practice of not attempting the radical operation in the presence of obstruction, and of the recognition of the extreme importance of thorough mobilisation of the growth. Since then these principles have been more generally acted upon and with surprising improvement in the results. I can now only suggest that more care in the preparation of the patient along the lines suggested by Lord Moynihan, and very lucidly brought before the profession in his Harveian Oration of 1926, should be the rule. One wonders if perhaps by subjecting the growth to X rays or, in certain selected cases by the use of radium, the field of operability could be still further enlarged. These are matters which are as yet not settled, and it will perchance fall to the lot of some other orator to bring the result of experience along these lines before you. One thing I do indeed wonder with regard to malignant disease, and that is, whether we do not sometimes disseminate a comparatively innocuous growth by the manipulations which are necessary for its removal. This is suggested by the long history which sometimes precedes operative interference, and the relatively early recurrence dissemination which may follow it.

FIG. 8A.



A sigmoid growth densely adherent in the left iliac fossa and involving the parietes extensively. It was exposed and removed by an oblique muscle-cutting incision directly over it. Fig. 8B shows the growth in section. The patient is alive and well five years later.

FIG. 8B.



Same case as Fig. 8A. Shows the growth in section.

I am glad to have this opportunity of thanking those numerous medical friends who have so kindly helped me to keep in touch with their patients. I am sure that my recurring requests must often have proved a great annoyance.

In concluding this review of so important a subject, I realise acutely how very much has been left undone. A busy surgeon, with ever-increasing hospital duties and teaching responsibilities, is hard set to find the time to make use of the abundant material which passes through his hands. The coöperation of those less insistently occupied and more closely in touch with the resources of a pathological department is essential, and as I have preserved a great many of my specimens, I hope at some future time to add the result of an extended microscopical investigation in relation to the clinical results. Meanwhile, in extenuation of my manifold shortcomings, let me shelter behind these comforting words of Pope:—

> "Whoever thinks a faultless piece to see,
> Thinks what ne'er was, nor is, nor e'er shall be."

EXPERIMENTAL TREATMENT OF CANCER WITH TUBERCULIN.*

BY RAYMOND PEARL; ALAN C. SUTTON, M.D.;
AND
W. T. HOWARD, JR., M.D.

IN a paper by Pearl[1] on the relation between cancer and tuberculosis the following statement was made :—

> "After this paper had been accepted for publication on June 11th, 1928, I asked Alan C. Sutton, M.D., a member of the staff of this Institute, and that of the Johns Hopkins Hospital, to undertake during the summer the preliminary organisation of experimental work on the treatment with living tubercle bacilli and tuberculin, of transplantable cancer in rats. In the discussion of these experiments it was decided that it would be highly desirable to see what would be the result of specially treating malignant tumours in human beings with some form of tuberculin when suitable cases for such treatment could be obtained, in view of the obvious deductions which logically follow from the results of the present study of autopsy material. The ideal case for a trial would be one in which, first, a carcinoma or a sarcoma had been removed surgically, and the malignant character of the tumour definitely proved from sections of the surgical specimen; in which, second, there has been at some later date an extensive, inoperable recurrence of the same tumour, confirmed by biopsy. If in such a case the tumour retrogressed or disappeared, following special tuberculin treatment alone, the evidence would have real significance.
>
> "A small number of carefully selected cases of malignancy are now being treated by Dr. Sutton, under the direction and in consultation with the writer. Treatment of the first case began on July 10th, 1928."

It now seems desirable to report very briefly, and in an entirely preliminary way, on the progress to date of the work which we have done in treating cases of malignant disease in human beings with tuberculin. This preliminary statement will be followed in due course by a complete report presenting all the histopathological, clinical, and therapeutic data.

In the beginning stages of the trial of a new therapeutic agent for the treatment of cancer it was felt that it would be morally unjustifiable to accept for treatment any other than terminal stages of the disease, where any and all other methods of treatment had been abandoned as hopeless. Consequently all of the cases so far treated have been of this character, except one which came under treatment through unexpected circumstances in an early stage of the disease. It is our purpose to report briefly here only upon the cases which have been under treatment and study a sufficiently long time to give some reliable indication of the effect of the tuberculin therapy.

Clinical Histories.

CASE P 1.—Female, aged 52. Radical removal of left breast, May 18th, 1922. Adenocarcinoma. Partial excision of left supraclavicular lymph gland Sept. 21st, 1927. Metastatic carcinoma. X ray of chest at this time showed areas of consolidation in lower portion of right lung. Examination on July 1st, 1928, showed extensive recurrence in supraclavicular glands and extension of lung involvement. *Condition at beginning of treatment:* Patient bedridden, cyanotic, dyspnœic, with frequent attacks of severe coughing, during which the head and neck were engorged with blood, leaving her completely exhausted. Obstruction of pylorus, with 24-hour retention and daily vomiting. Her condition was rapidly and progressively getting worse. *Treatment:* Begun on July 10th, 1928, with B.F. tuberculin (bouillon filtré Denys). It has continued to the present time (April 1st, 1929). On account of the marked improvement in the patient's clinical condition, and because of the marked reduction in the size of metastatic supraclavicular glands, there was removed, surgically, a piece of one of these glands on Jan. 15th, 1929. Sections show a marked alteration as compared with material before treatment, chiefly characterised by extensive fibrosis, and œdema of residual cancer cells. *Present condition:* Patient is greatly improved. There is very little shortness of breath and that only on exertion. No cyanosis. There are only occasional mild attacks of coughing. She leads a life of moderate activity. Goes to theatre, luncheons, and climbs stairs and walks eight to ten blocks without much discomfort. Vomits only occasionally when mentally depressed, but there is no evidence of retention. Weight is constant at around 160 lb. X ray shows right lung practically clear.

CASE P 2.—Male, aged 57. Resection of pyloric end of stomach Jan. 10th, 1928. Carcinoma. On June 1st, 1928, noticed small lump in body wall wound, which continued to increase in size until on Oct. 16th, 1928, it measured 9 cm. in diameter. Its shape was that of an inverted half grape fruit. A smaller separate nodule in the lower portion of the wound measured 3 cm. in diameter. Metastatic gland in both axillæ. *Condition at beginning of treatment:* Patient emaciated and anæmic. Unable to work. *Treatment:* With B.F. tuberculin begun Oct. 17th, 1928, and has continued to the present time (April 1st, 1929). As the treatment progressed the tumour mass got progressively softer. On Feb. 1st, 1929, it began to slough over upper pole, and to drain from a central sinus. The character of this discharge indicated that hemorrhagic degeneration of the tumour mass was in progress. Because the large metastatic gland in the right axilla was apparently undergoing similar degeneration it was surgically removed on Feb. 19th, 1929. Sections show extensive œdema and vacuolation of the residual cancer cells, and congestion, hæmorrhage, œdema, and fibrosis of the stroma. Since the sloughing and drainage of the main tumour mass it has greatly diminished in size and improved in appearance. Normal epithelium has grown in over the cancerous tissue at the central drainage point and over the superficial ulcerated area at the upper pole. Unfortunately, while the central tumour was draining there was an extensive hæmorrhage one night which stopped itself, but left the patient very anæmic. *Present condition:* Tumour is approximately one-third of its maximum size. There is no evidence of new involvement. The chief concern now is the extreme anæmia following the severe hæmorrhage. This is at present improving, however, and there is now no bleeding at any point. Our impression is that the treatment was pushed too rapidly in its early stages, with a consequent too rapid disintegration of the tumour mass.

CASE P 3.—Female, aged 62. Radical removal of left breast Jan. 2nd, 1928. Adenocarcinoma. Radical dissection of metastatic left supraclavicular glands, Oct. 2nd, 1928. Partial excision of metastatic brain tumour Nov. 9th, 1928. This last operation was undertaken for the purpose of giving an opportunity to try tuberculin treatment, because the metastatic growths were rapidly progressing, and it was felt that unless a temporary stay could be obtained the patient would die from the brain metastasis before a fair trial of the tuberculin could be had. *Condition at beginning of treatment:* General condition good as to weight and blood picture. *Treatment:* With B.F. tuberculin began Oct. 30th, 1928, and has continued to the present time. *Present condition:* General nutrition still good and blood picture shows no particular change. Recently there has been gradual reappearance of brain symptoms, possibly due to pressure from œdematous reaction of residual tumour tissue following each treatment. With this thought in mind tuberculin is now being temporarily discontinued, to see whether relief of pressure symptoms will follow.

CASE P 4.—Female, aged 35. Radical amputation left breast with pectoral muscles and axillary glands, Dec. 8th, 1926. Many metastases in left axilla, especially along vessels. Medullary carcinoma. Second operation Feb. 28th, 1927, and metastatic deep cervical glands removed from left posterior cervical triangle. No tissue saved for pathological examination, or if saved was lost. On Feb. 9th. 1928, several small metastatic glands were discovered above the left clavicle. She was given courses in X ray treatment until Nov. 9th, 1928, when this therapy was discontinued because it was thought to be having a deleterious effect upon the blood picture. *Condition at beginning of treatment:* General condition excellent. Bothered only by slight cough. *Treatment:* With B.F. tuberculin begun on Nov. 16th, 1928, and continued till death. This patient exhibited a very low degree of sensitivity to tuberculin, and did not show the usual reactions following therapeutic injections. On this account the dosage was rapidly pushed up so that by Dec. 10th she was receiving 1·0 c.cm. full strength B.F. tuberculin, which was raised on Dec. 22nd to 1·5 c.cm. This was followed by a rather severe general reaction with slight elevation of temperature. From this time on, though there was no apparent reaction to increased dosage of tuberculin, the patient complained of weakness, increased cough, and substernal pressure. On Jan. 6th, 1929, she developed a right side hydrothorax. On Jan. 11th the patient died. A partial autopsy revealed a malignant pericarditis and a non-malignant polyserositis involving both pleura and peritoneum. Sections of tissue removed at autopsy showed remarkable and extensive changes in the cancer cells, particularly marked œdema of the cell body, much vacuolation, and shrinkage and degeneration of the nuclei. In view of the history it is impossible to prove that the marked alteration of the cancerous tissue observed at autopsy was solely due to the tuberculin treatment. It may have been the result of the X ray treatment, though the fact that the pericardial involvement showed the same changes perhaps makes this latter hypothesis somewhat improbable. Our general impression regarding this case, which is, however, incapable of proof, is that the dosage of tuberculin was pushed too rapidly, and brought about, on the one hand, too rapid degenerative alterations in the tumour tissue wherever located, and induced a condition of protein shock on the other hand. The unfortunate outcome led us to modify the general plan of treatment in all the cases, in the direction of not pushing the tuberculin dosage too rapidly.

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* Preliminary Report from the Institute for Biological Research of the Johns Hopkins University, Baltimore, U.S.A.

[1] Pearl, R.: Cancer and Tuberculosis, Amer. Jour. Hyg., 1929, ix., 97.

CASE P 5.—Male, aged 38. Admitted to hospital Nov. 12th, 1928. Diagnosis (without operation or biopsy) inoperable carcinoma of rectum, with probable metastases to liver and retroperitoneal lymph glands. Secondary anæmia. Jaundice. *Condition at beginning of treatment:* General nutrition poor, had lost weight (weight = 135 lb.), marked secondary anæmia (red blood corpuscles, 2,100,000, hæmoglobin, 38 per cent.) Unable to work. *Treatment:* With B.F. tuberculin began Nov. 15th, 1928. Continued until Dec. 15th. At that time the patient felt so much better that he determined to leave the hospital and go to New Jersey for the Christmas holidays. This he did. On Dec. 28th he returned and treatment was begun again. Before leaving the hospital his blood had been built up by transfusion, but while absent he had bled profusely and became again very anæmic. Tuberculin treatment was continued until Jan. 30th, 1929. No further transfusion was given, though indicated, because he had no money to pay for it, and the hospital refused it without payment. On Feb. 1st, 1929, he was discharged from the hospital, without notice to either of the authors of this paper, because he refused a colostomy, which was advised by the hospital staff on the ground that complete occlusion of the bowel was impending. He received no further treatment. *Present condition:* On March, 20th, 1929, the patient unexpectedly turned up at the dispensary for the purpose of informing anyone interested that he was feeling well. On March 22nd his R.B.C. = 3,460,000 and Hb. = 45 per cent. He had been steadily gaining weight. On April 4th his weight was 155 lb., or 20 lb. more than on admission. Is strong. Has no bleeding. Proctoscopic examination of the rectal tumour shows now a considerable opening through it. There is no evidence of ulceration and the tumour mass is distinctly smaller than at the beginning of treatment. The jaundice disappeared shortly after treatment was begun and has never returned.

CASE P 6. Male, aged 66. In December, 1927, patient began to have attacks of gas with nausea and vomiting. From this time to May 6th, 1928, lost 25 lb. in weight. At operation, May 6th, 1928, was found to have inoperable carcinoma of stomach, so extensive that there was not enough normal stomach wall to permit any kind of anastomosis. Metastatic gland removed at operation showed adenocarcinoma. *Condition at beginning of treatment:* Emaciated, marked secondary anæmia, daily vomiting. *Treatment:* With B.F. tuberculin started Nov. 27th, 1928, and has continued to present time. Has had no other treatment. During first month of treatment did not feel so well. Thereafter marked improvement noted in stomach symptoms. Vomiting and pain practically entirely stopped. *Present condition:* Weight has stayed practically constant at around 145 lb. since beginning of treatment until recently when there was a temporary drop. It is now increasing. Stomach mass has decreased considerably from its maximum size. In early stages of treatment the anæmia became progressively worse, but is now improving. Only occasional vomiting.

CASE P 7.—Male, aged 37. In May, 1927, patient complained of a knot the size of a hen's egg on chest wall. On Dec. 1st, 1927, a biopsy was done and a diagnosis of fibrosarcoma made. Jan. 1st, 1928, courses of X ray and lead treatment were started. These were discontinued on Sept. 15th, 1928, because they had apparently produced extreme anæmia, and because the tumour involvement increased steadily unaffected by the treatment. *Condition at beginning of treatment:* Emaciated, marked secondary anæmia, just able to do a little walking outdoors each day. Considerable coughing. *Treatment:* With B.F. tuberculin begun on Nov. 27th, 1928, and has continued to present time. *Present condition:* Blood picture has improved. Has stopped coughing. Weight has stayed constant. Tumour has shown no growth during past four months, though steadily growing before that time.

Histological Changes.

Following the tuberculin treatment there are certain noteworthy changes in the tumour tissues which, in general, appear to be proportional in amount to the clinical damage suffered by the tumour. On the part *of the stroma they consist:* (1) of congestion of veins and capillaries, œdema and hæmorrhage, often attended by invasion by leucocytes—chiefly polymorphonuclear neutrophiles, lymphocytes, and plasma cells; (2) proliferation of fibroblasts; (3) hyaline change; (4) sclerosis with compression and distortion of the cancer alveoli, usually associated with atrophy *(shrinkage) of the cancer cells.*

On the part of the cancer cells the changes affect both nucleus and cytoplasm. In regard to the latter, perhaps the earliest change is swelling, associated with a loss of affinity for eosin, resulting in an appearance almost identical with that of cells in the early and midphases of mitosis. A more marked and probably later change is the appearance of larger and smaller round or oval vacuoles. In such cells, in material fixed in Zenker's fluid and stained with hæmatoxylin and eosin, there is to be seen very frequently a finely fibrillar meshwork, the spaces of which may appear empty or may contain finely granular material. In extreme degrees of vacuolation, a single vacuole may fill nearly the whole of the cell, which is often markedly swollen and distorted. Larger vacuoles may contain finely granular matter, or larger or smaller hyaline masses, deeply stained with eosin. Frequently large vacuoles are ruptured with escape of their contents. Viewed with the low power these vacuolated cells, with their condensed cytoplasmic walls, resemble cysts of certain protozoa. A second important cytoplasmic change is a form of degeneration ending in the transformation of the cytoplasm into hyaline material with marked affinity for eosin. A third change, probably associated with rupture of the cell membrane is disintegration, with the escape of finely granular material, the granules being somewhat larger than those normally present. Such cells have apparently previously undergone swelling without vacuolation.

In consequence of these changes many alveoli consist of single or a double row of cells in various stages of vacuolation, hyaline change, or granular disintegration, surrounding a large or small central cavity containing tumour cells in various stages of the above-described degenerations, cell and nuclear fragments, fine and coarse granular material, hyaline in globules or in large wavy masses, and occasionally leucocytes. The nuclear changes include swelling, with dissolution of chromatic material, hyperchromatism, shrivelling, and fragmentation.

Method of Treatment.

The tuberculin used is a bouillon filtrate from Human Strain No. 37. The method of its preparation is fully described by Willis,[3] p. 137. We are greatly indebted to Dr. Allen K. Krause for providing the tuberculin for our work. In the treatment the tuberculin is injected subcutaneously. The dosage and interval are regulated according to the sensitivity of each individual patient, as determined by intracutaneous test with O.T. There appears always to be a definite reaction in the tumour involvement, wherever located in the body, following each injection of tuberculin. Our experience indicates that during the first six weeks of treatment the dosage should be kept low. At the end of about that period there appears usually to occur a definite change for the better in the patient's condition, although up to that time little in the way of definitely observable results of the treatment is to be seen. After the first six weeks the dosage may be cautiously increased, and this appears from our present experience to be advisable. But at all times great caution must be exercised, or the patient may be killed, either by the too rapid production of toxic products from the alterations induced in the tumour tissue, or from something closely resembling allergic shock.

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[3] Willis, H. S.: Laboratory Diagnosis and Experimental Methods in Tuberculosis; Springfield, Illinois (C. C. Thomas), 1928.

Arrangements were made on Jan. 28th, 1929, with the Harvard Medical School, and on March 19th, 1929, with St. Elizabeth's Hospital in Washington, D.C., to undertake the tuberculin treatment of series of cancerous patients in coöperation with this Institute. The work is already under way in these two institutions. Dr. Joseph C. Bloodgood also has recently started a series of cancer patients on tuberculin treatment.

This paper is a preliminary progress report only. The evidence which has so far been accumulated does not warrant any positive conclusion whatever regarding the ultimate therapeutic value of tuberculin in the treatment of cancer. The cases which have been treated are too few in number, and even in these cases the final outcome is still too uncertain to justify any far-reaching or final deductions. The clinical and histo-pathological results which have been obtained, however, taken in connexion with the positive conclusions from the study of the autopsy material already reported by Pearl (loc. cit.), are of a sufficiently promising character to warrant the continuation of the investigation. In a matter of this sort, where there is even a possibility that a therapeutic agent may be of value in the treatment of cancer, it is morally imperative that the medical profession be at once put in possession of the facts. Unquestionably the lives of some, if not all, of the patients whose histories are recounted above have been prolonged beyond the duration they would have realised had the tuberculin not been given. More than this cannot now be said. But even so much must, on humanitarian grounds, be made public to the medical profession. What is the most effective method of using tuberculin in cancer therapy, or what the effect of tuberculin would be on early cancer, and when used in combination with surgery, radium, and other modes of cancer therapy we are unable either to state or to predict, but obviously these matters want investigation, and in due time will doubtless receive it.

THE PAIN AND DISCOMFORT OF CONGESTIVE HEART FAILURE.

By K. SHIRLEY SMITH, M.B., B.Sc.,
M.R.C.P. Lond.,
MEDICAL REGISTRAR, MIDDLESEX HOSPITAL; LATE RESIDENT MEDICAL OFFICER, NATIONAL HOSPITAL FOR DISEASES OF THE HEART, LONDON.

THE investigations described in this paper were undertaken in order to determine the incidence and nature of pain and discomfort in congestive heart failure. The pain that is presumably of cardiac origin and also that arising from the various complications attendant upon failure are considered. In the first part of this paper details are given of the analysis of the pain associated with failure in 105 patients. In the second part an attempt has been made to discover from the history, the examination, and the progress of 33 of the patients the origin and significance of the various types and grades of pain. Angina pectoris has been excluded, except that a few patients have anginal pain although suffering from some degree of congestive failure. With nine exceptions the cases were in-patients at the National Hospital for Diseases of the Heart.

The following groups of cases have been included under the term congestive failure:—

(1) Patients with *severe failure*, showing such signs as orthopnœa, enlargement of the liver, and pulmonary and other œdema.

(2) Patients with *moderate failure*, having troublesome dyspnœa and some signs of venous congestion—for example, crepitations at the bases or hepatic engorgement.

(3) Patients with slight failure, in whom *breathlessness* is observed at rest, with or without slight œdema of the feet, not previously present.

(4) Patients complaining of *anginal pain on effort*, but also showing evidence of congestive failure as above.

The Frequency and Origin of Pain in Failure.

With the aim of determining the incidence of pain in failure and its distribution according to intensity and origin, an analysis was made of the cases admitted to the National Heart Hospital over a period of six months. The following Tables show the results of this investigation. Table I. needs no explanation. Table II. shows the incidence of pain in relation to its source.

TABLE I.

Total patients admitted to the National Heart Hospital during six months		173
Number showing signs of congestive failure		105
(*a*) Number complaining of pain associated with failure	67	
(*b*) Number complaining of pain more than any other symptom	6	
(*c*) Number having or developing pain not of cardiac origin (1) alone, (2) in addition to previous pain, presumably cardiac ..	14	
(*d*) Number free from pain before and after admission	18	

TABLE II.—*Sources of Pain and Discomfort.*

(*a*) *Presumably cardiac*—that is, no other cause is found (Table I. (*a* and *b*))	73
(*b*) *Due to complications or sequelæ of failure*:—	
1. *Pulmonary and pleural*—	
(*a*) Infarction of lung	5
(*b*) Hydrothorax, primary	1
(Two patients developing hydrothorax from failure had no new pain with it.)	
(*c*) Pleurisy only—i.e., friction only	1
(In this case there were no subsequent signs suggesting further lesion, such as infarction or hydrothorax.)	
2. *Hepatic or gastric.*—Right hypochondriac or epigastric pain with hepatic enlargement ..	10
3. *Œsophageal.*—Dysphagia	1
4. *Pain of œdema*:—	
(*a*) Sacral	2
(*b*) Above ankles	1
(*c*) Antero-internal aspect of thighs	1
5. *Pain of thrombosis* of systemic veins (popliteal) ..	1
(Many patients show more than one complication associated with pain, hence the total incidence is greater than the total number of cases (14)).	

Œdema is generally regarded as painless. The complaint of pain in association with it might, at least in sacral œdema, be attributed to the discomfort of the recumbent position in bed. Yet the only patients who complained of sacral pain were found to have considerable œdema of the sacrum. One of the patients studied in detail, but not included in the above series, complained of the simultaneous onset of swelling of the legs and pain above the knees. The single instance of dysphagia in a series of 105 cases illustrates the rarity of this symptom in congestive failure. In view of the displacement of the œsophagus and the holding up at the level of the auricles of an opaque bolus, as shown by the X rays, a greater frequency of dysphagia might be expected.

Pain and discomfort may occur early or late. Early pain is almost invariably sternal and of cardiac origin, and occurs at the onset of failure. Late pain often arises from the heart, but it may be due to complications and therefore attributable to other organs.

I. *The Sternal Pain of Early Failure.*

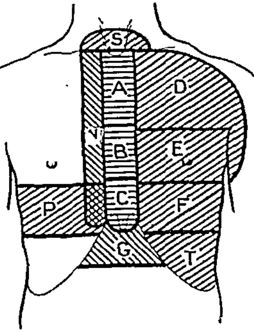
A considerable proportion of all patients complaining of pain associated with congestive failure are found to have had sternal pain on effort at some time in their history; this pain has most commonly been experienced when the reserve of the heart was diminishing—that is, when breathlessness was noticed with less and less exertion, and when slight swelling of the ankles first made its appearance in the evenings. The pain is generally midsternal, and although it may be stabbing and rather severe, it is sometimes more a dull aching pain associated with a sensation of choking or of tightness across the upper part of the chest or around the waist. Occasionally it is described as a feeling of oppression or of weight on the chest, though in such cases the symptoms amount to little more than discomfort. Concomitant breathlessness is always experienced in some measure. The sternal pain in early failure is always relieved by rest, so that patients remark that it passes off after a few minutes. There is radiation of the pain in a few cases. In some it is described as passing into the left arm (Cases 1 and 5); in others as passing straight through to the back (Case 2); and occasionally as spreading toward the left nipple (Case 3). As failure becomes established this pain is no longer felt.

It is the increasing breathlessness that is accompanied by the pain, and, similarly, the pain may diminish when the ankles begin to swell. If, from the 33 consecutive cases, the four suffering from angina pectoris are excluded, 29 remain. Of these 29 patients 13 experienced the sternal pain described above. The total of 13 excludes those patients suffering at times from sternal pain, but in whom the relation to exercise was not established. Sternal pain and tenderness on percussion over the sternum have been described by Libman[1] in subacute bacterial endocarditis. They are among the later manifestations of the disease and are therefore usually accompanied by cardiac failure. Although two or three cases of this disease were included in the 105 cases of failure studied, neither pain nor tenderness in the sternal region was observed in them.

II. *Pain Associated with Established Failure.*

Twenty-seven cases in which pain or discomfort were experienced in established failure have been classified according to the location of the pain. In order to facilitate the description of areas affected by the pain two diagrams were constructed (Figs. 1 and 2). In these the anterior and posterior aspects of the thorax were divided into the areas which were found to express best the numerous diagrams made from individual patients at the bedside. The names applied to these areas in the following description are self-explanatory, except that the term "parasternal" signifies an area lateral to the sternum and extending one inch from the sternal border.

FIG. 1.



Composite diagram showing location and distribution of pain (anterior aspect).

1. *Sternal pain* (A, B, and C) was only complained of in relation to exertion, and was never present in the patients in hospital, except when these areas were involved by pain spreading from some other region.

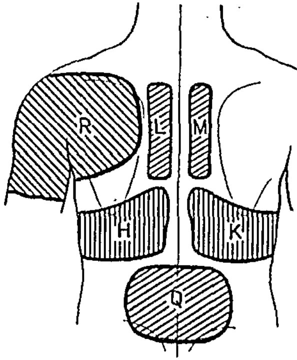
2. *Left Supramammary pain* (D) occurred only four times. The medial aspect of the upper arm was involved in all, and in two of them aortic incompetence was present.

3. *Left mammary and inframammary pains* (E and F) were more common than any others, being recorded 21 times. Of these patients 13 were fibrillating. Otherwise this group is made up of cases representing many varieties and combinations of cardiac lesions.

4. *Epigastric pain* (G) is found four times, in each case associated with considerable enlargement of the liver, and in two cases with rapid enlargement.

5. *Subscapular pain* (H and K).—(1) Bilaterally: two cases, associated with pulmonary infarction and coughing respectively. Both were cases of mitral stenosis. (2) Unilaterally: 11 cases (10 left-sided); 7 of these had mitral stenosis.

FIG. 2.



Composite diagram showing location and distribution of pain (posterior aspect).

6. *Interscapular pain* (L and M).—(1) Bilaterally: two cases; both had mitral stenosis, one had aortic incompetence as well. (2) Unilaterally: four cases (three left-sided); three had aortic incompetence.

7. *Right parasternal pain* (N).—One case: aortitis and aortic incompetence.

8. *Right inframammary pain* (P).—One case: enlarged left auricle extending to the right.

9. *Lumbo-sacral pain* (Q).—Two cases, both with much sacral œdema.

10. *Left scapular and upper arm pain* (R).—One case, in angina pectoris, by spreading from left inframammary pain.

11. *Suprasternal pain* (S).—Three cases; in two angina pectoris was present, but the suprasternal pain occurred apart from the attacks. In the third case there was hypertension.

12. *Left hypochondriac pain* (T).—Three cases; in all of these very severe failure was present, the liver being greatly enlarged while œdema involved the legs, sacrum, and lungs.

Presence or Absence of Hyperalgesia and Superficial Tenderness.

In his pioneer work on the pain of heart disease Head[2] has described local and referred pain. The former is distinguished by its restriction to the body surface immediately superficial to the organ affected, and by tenderness on pressure over the affected part. Referred pain, also investigated more from its clinical aspects by Mackenzie,[3] is characterised by *its distribution in areas remote from the origin of the pain* and by hyperalgesia of the skin as elicited by pinching. Such pain is relieved rather than exacerbated by pressure. Thirty-three cases of congestive failure in which pain was a symptom have been examined in detail for hyperalgesia of the skin and tenderness of subjacent structures. Hyperalgesia was determined by pinching the rate is falling, fibrillation is persisting, so there must be some factor beyond auricular fibrillation to account for the pain. That the pain of angina pectoris is often due to coronary disease and restriction of the blood-supply to the myocardium is not a new theory, but it has recently been further developed by Keefer and Resnik.[7] It it is true that the reduction of the oxygen-supply to the heart can produce anginal pain, the relationship between the rate of the heart and pain in failure seems explicable on the following grounds: the coronary vessels fill during diastole of the heart; when the rate increases the ratio between diastole and systole falls, the diastolic phase but not the systolic being shortened; there is thus less time for coronary filling and pain may ensue if the original blood-supply to the myocardium was only just adequate.

The association between pain and excessive rate of the heart has been further demonstrated by Barnes and Willius,[12] who have studied the occurrence of cardiac pain in paroxysmal tachycardia. Again, Schwartz [13] has shown that bouts of severe cardiac pain may arise in young adults with chronic valvular disease. In these patients the pain was always accompanied by violent and rapid beating of the heart.

(*d*) *Intracardiac Tension.*—It has been shown previously that cardiac enlargement is apt to be associated with tenderness and hyperalgesia of the chest wall, and the possibility of a causal relationship was suggested. Recent work on the occasional enlargement of the left auricle to the right may throw light upon this problem. Bedford,[14] and Bramwell and Duguid [15] have described the association between extreme left auricular dilatation to the right and pain in the right chest and axilla spreading to the right inframammary and right subscapular regions. Other cases have been observed by Labadille [16] and Mahaim.[17] This group of cases in which cardiac engorgement is a pronounced feature constitutes, as a whole, some support for the view that increasing intracardiac tension is a prominent factor in the production of the pain of established failure.

(*e*) *Coughing.*—In some instances pain in failure is partly to be attributed to coughing. In Cases 10 and 11 coughing was said to produce left inframammary pain, and in the first of these the pain spread through to the left subscapular region and tenderness developed over the affected parts. How this pain is produced seems doubtful. The onset of left-sided pain precludes the possible influences of increasing tension within the right side of the heart—an obvious result of prolonged coughing. Again, the causal relationship must be definitely established; for example, if cough results in the production of blood-stained sputum both cough and pain must then be considered as secondary to the initial event of pulmonary infarction. As cough generally arises from bronchitis this condition probably largely accounts for pain when it is retrosternal; when pain is lateral some other explanation must be sought. For example, it is obvious that much discomfort will be produced by coughing if there is hyperalgesia of the skin surface. Thus, in the light of present knowledge, pain in the left side of the chest produced or aggravated by coughing can only be ascribed to two causes—additional exertion, with concomitant increase in the pulse-rate, and repeated friction between the hypersensitive chest wall and the bed-clothes.

Factors Relieving the Pains of Failure.

The pains of failure may be relieved naturally in the course of the illness or they may yield to treatment. The following are the principal factors to be considered.

(*a*) *Establishment of Congestive Failure.*—The sternal pain of early failure is in nearly every case relieved by advancing failure, and when pulmonary and general œdema or hepatic engorgement have appeared this pain is no longer experienced.

(*b*) *Rest.*—Rest almost immediately relieves the retrosternal pain of effort. Inframammary and scapular pains are less rapidly relieved by rest and may continue but little abated after 24 or 48 hours in bed.

(*c*) *Hæmoptysis.*—The relief of thoracic pain and discomfort which sometimes follows hæmoptysis in failure may be regarded as support for the view that pain is produced by excessive tension within the lungs or right heart. This relationship is illustrated in Case 10, where the patient remarked that he generally felt better two or three days after an attack of hæmoptysis.

(*d*) *Therapeutic Measures.*—While the alleviation of pain and discomfort depend essentially upon removal of the underlying cause, some relief may be obtained by various measures. Sedatives such as bromide and chloral are useful, but the analgesics, for example, medinal, nepenthe, and liquor morphinæ hydrochloridi—may be required in severer cases and when insomnia from pain is undermining the general condition of the patient. Local applications are only to be recommended when pain is chronic and troublesome and when there is no danger of rendering an already hyperalgesic skin still more sensitive.

Angina Pectoris in Conjunction with Failure.

Among 105 patients with congestive failure only three were found to have angina pectoris. One other patient afflicted with both conditions was studied, making a total of four. Of these three were women, and the ages ranged between 43 and 57. Two of these patients were suffering from aortic incompetence. Syphilis seemed a likely ætiological factor, but in each case the Wassermann reaction was negative. In both the remaining patients there was disease of the aorta, this vessel being found higher and wider than normal on radioscopy. Negative Wassermann reactions were also given by these two patients. Three showed a systolic blood pressure of 200 or over, while that of the fourth was 145. In only one of the patients had anginal attacks occurred before the onset of dyspnœa, and in this case there was an interval of 14 months between the first attack of angina and the symptoms of early congestive failure. The history in all showed that the attacks of pain had become more severe and widespread as breathlessness became more pronounced; during treatment in hospital the attacks abated if they did not disappear.

No definite inferences can be drawn from four cases, but certain points are worthy of notice. Although the position of the pain and its radiation and relation to effort are typical of angina, there is an essential difference in the pain in these cases, since its onset is always more or less closely related to the beginning of congestive failure, and would seem therefore to depend upon morbid changes occurring in the myocardium. The complaint of dragging suprasternal pain in two of these four patients affords further proof of aortic disease, since it is generally believed that the arch of the aorta is segmentally referred to this area. This region, however, was not involved in the anginal attacks, so that no relationship is suggested between aortic disease per se and anginal pain.

Summary.

1. An analysis of 105 cases of congestive heart failure shows that only 18 escaped severe or incidental pain and discomfort. Pain was the primary complaint of 6 patients, while 67 experienced this symptom in addition to others more urgent. In 14 of the 105 patients the pain and discomfort arose from other structures than the heart.

2. Pain and discomfort due to complications or sequelæ of failure were found to be mostly pulmonary, pleural, hepatic, or gastric. Œdema, thrombosis, and œsophageal obstruction were also observed as causes of pain.

3. Pain of cardiac origin in congestive failure may be classified into: (*a*) the sternal pain of early failure; (*b*) the pain of established failure.

4. Sternal pain occurred at the onset of failure in 13 of the 20 cases analysed. It was always provoked by exertion and rapidly relieved by rest. Reasons

are given for believing this pain to be a very mild degree of angina pectoris.

5. The presence or absence of hyperalgesia and superficial tenderness were investigated in 33 cases. Only three patients experienced hyperalgesia, while superficial tenderness was present in 14. It was found that hyperalgesia and superficial tenderness were more apt to occur when the heart was much enlarged or beating rapidly.

6. The causes of pain in established failure are considered under the following heads: Exertion, cardiac rhythm, the rate of the heart, intracardiac tension, and cough.

7. Factors relieving the pains and discomfort of failure are described. These are, principally, rest, the establishment of failure, hæmoptysis, and therapeutic measures.

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A FATAL CASE OF NÆVUS UNDERGOING MALIGNANT DEGENERATION.

BY P. CLENNELL FENWICK, C.M.G., M.D.N.Z., F.R.C.S. EDIN.,
OFFICER IN CHARGE, RADIUM AND DEEP THERAPY DEPARTMENT, CHRISTCHURCH HOSPITAL, NEW ZEALAND;
AND
J. RUSSELL WELLS, M.B.N.Z., F.R.C.S. EDIN.,
ASHBURTON.

THE radium department of Christchurch Hospital has records of malignancy following trauma in several patients. In one soldier a rodent ulcer developed over the site of a piece of shell fragment lodged in the face. In three women rodent ulcer developed in the small scar caused by a splash of hot fat, received while cooking. Sir G. Lenthal Cheatle has done much work on the relation of cancer to nerve and trophic areas, and we suggest that in the following case the slight trauma over the nævus was sufficient to destroy the trophic nerve-supply and render the area vulnerable to malignant degeneration.

The Case Described.

A young lady, aged 19 years, consulted one of us (J. R. W.) in March, 1928. She had a small nævus on the left temperofrontal region. Six weeks before seeking advice she had knocked the nævus, and from that time had noticed that it was growing larger, was irritable, and tended to bleed at the slightest touch.

Examination showed a nævoid growth, about the size of a split pea, just at the hair-line in the left temperofrontal area. It was raised above the skin but not pedunculated. Two other small nævi were present on the left *parieto-occipital region, and a large nævus, the size of the* palm of the hand, was present between the scapulæ. This had been treated with radium for 10 months five years earlier, and was partially healed. It looked angry but was apparently quiescent.

Excision of the nævus on the forehead was advised, as a transition to malignancy was feared. The growth was excised on March 12th by an elliptical incision one-quarter of an inch beyond the margins of the growth and down to the pericranial tissues. The sutures were removed on the seventh day and the wound was then soundly healed. On June 5th the patient returned, and a recurrence of the nævoid growth was found in the centre of the operation scar, and also a small swelling in front of the left ear, in or on the parotid was noted. The patient was sent to Christchurch Hospital for radium treatment. A full-strength radium plaque was applied over the forehead nævus for 15 minutes, the dose for children being ten minutes. It was impossible to say whether the firm round swelling the size of a walnut found in front of the left ear was a growth of the parotid or a lymphatic gland; it was fixed and hard, though not tender.

On July 3rd the patient returned. The nævus had shrunk to a pin-point but the swelling in front of the ear was still present. On August 21st the patient was sent again to the radium department for further consultation. The nævus had practically disappeared, but the growth over the parotid was larger and several firm glands were felt in the left posterior triangle of the neck. Immediate operation was advised. On Sept. 4th one of us (J. R. W.) removed all the glands, making a wide dissection of the whole area. The growth over the parotid was excised. The pathological report showed malignant disease, so the patient was sent to Christchurch for radium packs. On Sept. 19th a radium pack of 210 mg. of element in platinum tubes was applied at a distance of 3 cm. over the neck, and a similar pack of 50 cm. was applied over the parotid area. The time of exposure was 48 hours.

The patient returned home. No recurrence appeared in the neck or face, but secondary growths appeared below the left breast, on the right side of the neck, and in the right axilla. The liver became greatly enlarged, ascites and pleural effusion supervened, and she died on Nov. 26th, about nine months after the injury to the forehead nævus.

Pathological Report.

Dr. A. B. Pearson, the superintendent of the pathological department, examined the parotid growth, and reported as follows:—

The tissue *consists of a portion of* salivary gland and supporting connective tissues. The tissue is invaded by a tumour of malignant peritheliomatous type. The appearances in the actual tumour are extremely variable in different areas. In some parts the tissue consists of whorled masses of closely compact cells supported in a fine but scanty connective tissue stroma, and in these masses a very small blood-vessel is frequently noticed in the centre of the cell masses. In other areas the cells are grouped in lobulæ, in the centre of which well-marked vessels or sometimes large blood spaces are clearly seen. In these very vascular areas the vessels or blood spaces are lined by a layer of flattened endothelial cells supported by a thin layer of connective tissue cells which are, in turn, surrounded by a thick mass of large malignant cells. In this particular position the tumour consists entirely of this tissue of vessels with thick layers of surrounding cells. The groups or lobules seem to be in contact with each other. No connective tissue can be seen between them. In all parts the general cell features are very similar. They are usually oval in shape, with granular cytoplasm and very large oval-shaped nuclei. Very commonly they show pronounced hyperchromatic staining. Occasionally giant cells are present. These cells have one nucleus each, which is very deep-staining, but in one area groups of giant cells are present, *and these are of unusually large size and very irregular* shape. They show a very large amount of cytoplasm and contain several large irregular nuclei. Quite a number of these cells contain ingested leucocytes and dark-brown pigment. Mitotic figures in the general cell tissue are very common.

The tumour tissue shows widespread areas of necrosis and liquefaction. The tumour has invaded parts of the salivary glands, but the main growth appears to be in the lymph gland. The lymphoid tissue of the gland is completely destroyed and, in some cases, the capsule is invaded. The general features suggest a rapidly growing and highly malignant tumour.

The points of interest in this case are as follows. A very healthy girl receives a slight blow upon a small nævus and nine months later is dead of widespread malignant disease. It is, of course, recognised that nævi can take on a malignant character, but the channels by which the malignant cells are spread is sometimes uncertain. In this case the metastasis appeared to follow the lymph channels, and the pathologist mentions that large blood spaces were reproduced in the metastatic deposits. Apparently the nævoid type was reproduced—that is, a slight trauma over a nævoid area caused some change to occur in the nature of the lining cells of the nævus which altered the character of the growth from benign to malignant, and these altered cells were carried to distant parts of the body and reproduced themselves in lymph glands.

THE "CŒLIAC AFFECTION"—IDIOPATHIC STEATORRHŒAS.

BY T. E. HESS THAYSEN, M.D.,
PHYSICIAN-IN-CHIEF TO THE MEDICAL DEPARTMENT, ST. ELIZABETH HOSPITAL, COPENHAGEN.

IN describing the "cœliac affection" Gee [4] says that it "is commonest in patients between one and five years old. Sometimes from India Englishmen *return sick with the cœliac affection; seldom it is* met with in adults who have never left our island." Since Herter [7] in 1907 rediscovered the occurrence of the cœliac affection in children, describing it under the name of "intestinal infantilism," later authors have only paid attention to cases in children and have forgotten that Gee also observed this lesion in patients returning from India and in adults who had never been abroad.

The cœliac affection that attacks Englishmen in India can hardly be anything but sprue. The symptoms Gee describes as characteristic of cœliac affection—pronounced emaciation, white diarrhœa, anæmia, and muscular atrophy—are just as characteristic of both diseases as are the negative macroscopic findings in the digestive tract, which Gee emphasises in the autopsy of cases of cœliac affection. Gee does not mention the presence of stomatitis—a complication of tropical sprue that could hardly be unknown to him—probably because there are cases of tropical sprue, especially in India, in which the stomatitis is inconspicuous or absent. It might seem more difficult to identify the instances of "cœliac affection" that Gee observed in patients who had never been outside England. Of course, one cannot altogether exclude the possibility that these were cases of pancreatogenous fatty diarrhœa. Gee, however, does not mention the presence of sugar in the urine—it is present in most cases of pancreatogenous fatty diarrhœa—and he did not find the conspicuous macroscopic changes in the pancreas (atrophy, tumour) that are the cause of this disorder. Assuming, therefore, that he had the opportunity of making a post-mortem examination of these cases it is most likely that they were cases of a lesion resembling sprue. Nothing, however, is known of the occurrence of such a lesion in England in the days of Gee.

At a meeting of the Royal Society of Tropical Medicine in 1899 Thin [33] reported that two colleagues had diagnosed sprue in a patient who had never been outside his native country, and questioned the diagnosis. Manson-Bahr [13] has met with only one instance. In other countries, also, reports of a sprue-like disease in individuals who have never been in the tropics (Mense,[16] Talma [28]) were exceedingly scarce until recent years, when it has been definitely established that such a lesion really does occur, and further that it is far from being so rare as was thought. It is therefore very likely that Gee's cases of cœliac affection were instances of that sprue-resembling disease later described as non-tropical sprue. Under the term "cœliac affection" Gee includes the lesion later called cœliac disease (Miller [17]) or intestinal infantilism (Herter [7]), or "schwere Verdauungsinsufficienz des Kindes jenseits des Säuglingsalters" (Heubner [8]) together with tropical and (probably) non-tropical sprue. My object in this communication is to discuss whether these three diseases are so nearly related that one is justified in grouping them under a common designation.

Comparison of Sprue with Gee-Herter's Disease.

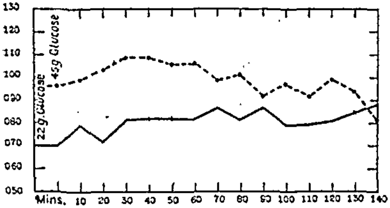
It is generally assumed that tropical and non-tropical sprue are the same disease, although this cannot be proved, as the ætiology and pathogenesis of both lesions are unknown. I shall therefore have to content myself with showing that Gee-Herter's disease and sprue are very nearly related and most probably identical lesions—a view that has been advanced before, on account of the conspicuous similarity in their symptomatology and course. Before I discuss the objections that have been raised against this view I shall briefly call attention to the most important points of resemblance in their clinical features and pathological anatomy. The patients have a strikingly characteristic appearance. They are markedly emaciated, their subcutaneous fat has disappeared, and their muscles are flaccid and atrophic. The large, meteoristically distended abdomen—particularly marked in children—forms a striking contrast to the thin extremities and the gaunt trunk. The skin is loose, pale, of a greyish, faded hue, without turgor, dry, often brownish. Other outstanding symptoms are: fatty diarrhœa, meteorism, anæmia, changes in the mucous membrane of the tongue, often mental disorder, achylia gastrica, and poor appetite alternating with ravenous craving for food. Organic changes in the nervous system are rarely present. A low blood-sugar curve after ingestion of glucose and abnormalities of the basal metabolism are to be found, and tetany is a frequent complication. In Gee-Herter's disease there is halisteresis which has also been demonstrated in cases of non-tropical sprue (Holst [9]).

The pathologico-anatomical findings are few, but almost identical in the two conditions. In several cases—and, it seems, more frequently in tropical than in non-tropical sprue and Gee-Herter's disease—there is enteritis or enterocolitis, and atrophy of the parenchymatous organs, with occasional fatty degeneration. These diseases occur most often in people with a previous intestinal lesion—in the tropics, especially amœbic dysentery. In some cases the disease runs an acute course with violent diarrhœa and pronounced emaciation, but the lesions—particularly in non-tropical sprue and Gee-Herter's disease—are apt to become chronic, with alternating periods of improvement and apparently unexplainable exacerbations. Tropical sprue is said to be seldom definitely cured unless the patient moves to another climate. A similar effect from change of climate may be seen in non-tropical sprue and in Gee-Herter's disease. One of my patients (No. 1) suffered constantly from steatorrhœa while at home; his stools became perfectly normal during a stay in France, and when he returned home the fatty diarrhœa set in anew. In Gee-Herter's disease also remissions have been observed when the children are moved to some other locality.

The mortality in Gee-Herter's disease is estimated by Schaap [24] at 13 per cent.; Halblützel-Weber [5] found it to be about 23 per cent. Of 23 patients with non-tropical sprue five are known to have died, but one died from an accidental complication. From tropical sprue Manson-Bahr [12] reports seven deaths in 45 patients with pronounced gastro-intestinal symptoms and stomatitis. If he had included cases with severe anæmia the death-rate would certainly have been higher. The lesions are not as clearly defined as would be desirable, since there are cases of sprue and of Gee-Herter's disease in which the fatty diarrhœa is not pronounced. Future investigations will have to decide whether such cases should be distinguished from the classical ones.

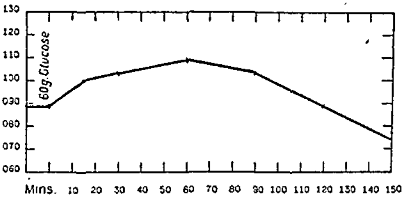
The pathogenesis is generally agreed to be an absorption-disturbance which primarily concerns the fats in the food, together with calcium salts and water and, to a lesser extent, proteins. But there is still a great deal of uncertainty with regard to the cause of this absorption disturbance. Judging from the literature, enteritis is rather frequent in tropical sprue.* If on this account the absorption disturbance is regarded as due to an intestinal lesion, even in cases where microscopic examination of the intestines gave negative results (v. d. Scheer [26]), non-tropical sprue and Gee-Herter's disease must also be considered as due to an intestinal lesion, even though it is rarer to find enteritis on microscopic examination in these conditions than in tropical sprue. Our knowledge of pathological changes in the intestines is so deficient that a lesion of the intestinal wall might easily exist without being recognised. Four fatal cases of non-tropical sprue were examined microscopically; in two of these (Blumgart,[2] Holst [9]) the intestinal wall showed no inflammatory changes; in one (Rosendahl [23]) it showed a slight, subchronic enteritis which, the author thinks, could not have been the cause of the protracted diarrhœa. Only one case (Manson-Bahr [15]) from Palestine showed definite colitis. It should be borne in mind that acute and chronic enteritis are very common lesions in the tropics. On the whole I agree with those who are sceptical of enteritis as the cause of these diseases.

FIG. 1 (Case 9).



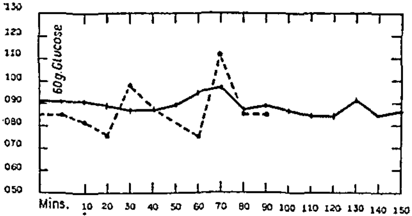
Gee-Herter's disease.

FIG. 2 (Case 14).



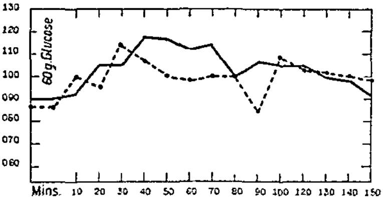
Tropical sprue.

FIG. 3 (Case 8).



Non-tropical sprue.

FIG. 4 (Case 5).



Non-tropical sprue.

Objections to the Identification of Sprue and Gee-Herter's Disease.

In a discussion at the Royal Society of Tropical Medicine Reginald Miller [18] is reported as follows: "Owing to insufficient knowledge of the two diseases there was no agreement as to whether cœliac disease was the same as sprue, but there were notable differences. Cœliac disease always originated in childhood and, even without treatment, there was amelioration as maturity was reached. It was very seldom fatal, and did not occur in epidemics. Among children the essential feature of the disease was disorder of fat absorption, and it has nothing to do with intestinal disease, in many cases there being no diarrhœa and usually no ulceration of the tongue." In the same discussion Arthur Powell [21] emphasises the following points: "In sprue post-mortem examination invariably revealed a shrinkage of the liver and great attenuation of the stomach with loss of epithelium; these conditions were not observed in cœliac disease, which was characterised by enlarged spleen and great pain in the stomach. Vomiting was more frequent in cœliac disease than in sprue. In cœliac disease the appetite was poor and capricious, whereas in sprue it was the opposite. There was a tendency to dropsy in cœliac disease, while there was shrinkage of the body in sprue." Schaap,[24] who has described three cases of Gee-Herter's disease, states :—

> "La maladie cœliaque a également des rapports avec la spruo (l'aspect et la constitution chimique des fèces, l'anémie), pourtant la glossite aphteuse typique qui mène a l'atrophie fait défaut, bien que la langue dans la maladie cœliaque puisse présenter aussi des anomalies moins accentuées."

In discussing the differential diagnosis between sprue and Gee-Herter's disease, Lehndorff and Mautner [11] declare :—

> "Die Frage der Differentialdiagnose zwischen Coeliakie und Sprue hat bei der Seltenheit der letzteren in Europa für uns nicht viel Bedeutung. Die klinische Aehnlichkeit beschränkt sich auf die groben Züge der Krankheit, rezidivierende Diarrhoeen von jahrelanger Dauer, abnorm lichte Fettstühle, eine kleine Leber in einem sehr grossen aufgetriebenen Abdomen, allgemeine Schwäche und Gewichtsverlust; gemeinsam ist ferner beiden Affectionen *die negative Kalkbilanz und die Häufigkeit einer* komplizierenden Tetanie. Die für die Sprue charakteristische Mundaffection, eine Glossitis mit aphthösen Geschwüren an der Zunge, kommt bei der Coeliakie nicht vor. Ein weiterer Differenzpunkt besteht darin, dass die Sprue in einzelnen Gegenden epidemisch auftritt, die Coeliakie ist ausschliesslich ein Leiden der frühen Kindheit, während die tropischen Aphthen fast nur Erwachsene befallen."

Thus all the authors cited are agreed that there are such great differences between sprue and Gee-

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* Several of the microscopic changes described are due to autolysis.

Herter's disease that the two lesions cannot be taken as identical. But the arguments advanced against this view are somewhat conflicting. Miller[17] and Lehndorff and Mautner[11] emphasise that typical aphthous stomatitis is not met with in Gee-Herter's disease, whereas Schaap[24] emphasises that similar, although less pronounced, changes do occur in Gee-Herter's disease. The last author is decidedly wrong when he states that atrophic glossitis does not occur in Gee-Herter's disease. Powell[21] finds that shrinkage of the liver, which is typical of sprue, does not occur in Gee-Herter's disease, in which, on the other hand, there is enlargement of the spleen. In this, however, he is in conflict with other authors, who lay particular stress upon the liver dullness being diminished and the spleen shrunken in Gee-Herter's disease. That difference in the appetite which Powell mentions does not exist; nobody else has been able to observe it. The occasional appearance of œdema of the face and hands in children with Gee-Herter's disease does not constitute any essential difference between this disease and sprue; it may obviously be regarded as "hunger-œdema." In this connexion I may add that the thinning of the stomach wall with loss of epithelium, which Powell takes to be characteristic of sprue, is a purely post-mortem phenomenon.

The greatest difficulty in recognising sprue and Gee-Herter's disease as nearly related—probably identical—conditions originates, I think, from the view that sprue is a wholly tropical disease that only attacks adults, and that Gee-Herter's disease is a disease of temperate zones that only attacks children—an idea that is definitely expressed by Lehndorff and Mautner. Sprue is not a wholly tropical disease. The literature contains, to my knowledge, records of 23 cases of sprue which developed in temperate climates in patients who had never been in the tropics. These were: 3 in Holland (Nolen,[20] v. d. Scheer,[27] Talma[28]), 7 in Germany (Hegler,[6] Mense,[16] Richartz,[22] Schäffer,[26] Wilfert[34]), 1 in England (Manson-Bahr[13]), 1 in Norway (Rosendahl[23]), 9 in Denmark (Holst,[9] Thaysen[31]), 2 in the northern United States (Blumgart,[2] Lambright[10]). The disease is also met with in Morocco (Begg[1]) and Palestine (Manson-Bahr[14]). One is therefore fully justified in claiming that sprue is not exclusively a tropical disease and that it probably occurs in any country, even though it is most frequent in some countries with a tropical climate. This fact, which will undoubtedly be further established in the future, makes it necessary once more to discuss the question of the near relationship between sprue and Gee-Herter's disease.

With regard to the second main objection against this view—namely, that sprue attacks only adults and Gee-Herter's disease only children—I quote some observations by Manson-Bahr.[15] In his excellent book, "A Report on Researches on Sprue in Ceylon," he writes (p. 23) as follows:—

> "It is generally stated that sprue is seldom seen in Europeans below middle age. Nevertheless, it may develop *at any age, even in children* of European parentage. Van der Burg states that he has recognised the disease in children of 1½ to 4 years of age, though it is as a general rule extremely rare in young adults. The oldest man I saw in Ceylon suffering from sprue symptoms was a burgher of 76 years of age, the oldest European a man of 70; the youngest was a boy of 13 of mixed parentage. I have, however, reason to believe that the disease occurs in natives at a still earlier age. I saw a Tamil boy of 8 who presented typical sprue symptoms, of which he died four months later."

In the tropics sprue thus attacks children too, and one of the reasons why it is diagnosed so seldom may probably be that in children it usually has an acute and fatal course and does not develop into the more chronic Gee-Herter's disease, which is always regarded as a "disease of luxury." Heubner[8] emphasises that most of the cases of Gee-Herter's disease occur in the socially well-to-do classes.

Table I. contains the cases of non-tropical sprue and the cases—known to me—of Gee-Herter's disease in older children in which there is some information as to the onset of the disease. Of course, I realise that the onset in such cases is a difficult question to settle. Table I. shows that of 11 cases of non-tropical sprue four developed before the age of 20 years, and one of these even occurred in a child of 11 years. Among six cases of Gee-Herter's disease one began at the age of 13 years and two at the age of about 10 years. Though it is true that in the great majority of cases Gee-Herter's disease develops in the earliest years of life, it may also make its first appearance at a more advanced age; and even if most instances of sprue occur in adults, it may also develop in children. We find all ages represented—possibly with the exception of puberty (13–15 years), which recalls the fact that Miller and other authors state that children with Gee-Herter's disease improve when they reach puberty. On the whole these data go to show that it is impracticable to maintain the greatly emphasised difference between sprue and Gee-Herter's disease—namely, that the first is seen only in adults and the latter in children only. Gee is right, I think, when he introduces his paper on the "cœliac affection" with the following words, which have since been forgotten or overlooked: "There is a kind of chronic indigestion met with in persons of all ages, yet is especially apt to affect children between one and five years old."

TABLE I.—*Age of Patient at Onset of Lesion.*

Non-tropical sprue.				Gee-Herter's disease.			
No.	Age. Sex.	Age at onset of symptoms in years.	Author.	No.	Age. Sex.	Age at onset of symptoms in years.	Author.
1	44 M.	23	Thaysen.	1	9 F.	8	Schaap.
2	32 M.	18	,,	2	20 M.	10	Bramwell.
3	54 M.	20 (?)	,,	3	18 M.	10	,,
4	39 F.	37	,,	4	18 F.	5–10	Moorehead.
5	43 F.	41	,,	5	17 F.	13	,,
6	57 F.	56	,,	6	9½	ca. 9	Halblützel-Weber.
7	56 F.	40	,,	—	—	—	—
8	33 F.	17	Holst.	—	—	—	—
9	11 M.	?	Thaysen.	—	—	—	—
10	30 F.	16	Lambright.	—	—	—	—
11	39 F.	37–29	Wilfert.	—	—	—	—

Aphthous Stomatitis in Sprue.

In a discussion at the Royal Society of Tropical Medicine the condition of the tongue was particularly mentioned. Thin pointed out that there are two forms of sprue: one, especially frequent in the Indian archipelagos, is characterised by very marked changes in the mouth and tongue; the other, common in India, is characterised by violent diarrhœa, while the tongue does not undergo any change before the later stages of the disease. The tongue and oral cavity may be free from inflammatory alterations, even when the disease has persisted for several years. Tropical physicians, as far as I know, agree that alterations of the tongue in sprue are inconstant in occurrence and extent, and that there are forms of sprue—the well-known hill-diarrhœa, for instance—which are not complicated by aphthous stomatitis. Schaap[24] states that the tongue in Gee-Herter's disease may show similar changes to those of sprue; and Lehndorff and Mautner[11] point out that the tongue in Gee-Herter's disease is the site of a diffuse red irritation. Common to both diseases is the frequent occurrence of smooth atrophy of the tongue. The aphthous stomatitis in non-tropical sprue is not as a rule very conspicuous and shows but slight aphtha formation; it is not infrequently absent in the acute attacks. In this respect non-tropical sprue bears more resemblance to the sprue of India.

Considering the non-specific character of this stomatitis and its occurrence as a secondary phenomenon (v. d. Scheer[26]) in a group of diseases whose main symptom is fatty diarrhœa, I cannot see any reason for denying the near relationship—and even identity—of sprue and Gee-Herter's disease on the basis of a difference in the appearance and extent of the stomatitis.

To the above-mentioned symptoms common to sprue and Gee-Herter's disease I may add two more—the low blood-sugar curve and the abnormal basal metabolism. Ingestion of glucose (about 60 g. in adults, 1 g. per kilo in children) gives a rise of the blood-sugar curve amounting to about 60 or 70 mg. per cent. when the rise is defined as the difference between the highest blood-sugar value obtained and the fasting value, and provided that Hagedorn and Norman Jensen's technique is used and the blood samples are taken every 10 or 15 minutes. Even under these conditions, however, the rise of blood sugar varies somewhat, both in different normal individuals and in the same individuals on different days. A low blood-sugar curve—that is, a curve with a rise of 40 mg. per cent. or less—is found as an inconstant phenomenon in about 5 per cent. of the blood-sugar curves of normal individuals. I have *demonstrated that such a low blood-sugar curve is* considerably more frequent (50 per cent.) in sprue and Gee-Herter's disease than in normal people (Figs. 1, 2, 3, and 4).

TABLE II.—*Blood-sugar and Basal Metabolism in Sprue and Gee-Herter's Disease.*

No.	Age. Sex.	Date of examination.	Blood-sugar rise in mg. per cent.	Date of examination.	Basal metabolism (Benedict) per cent.	Remarks.
1	14 M.	16/6/25	27	—	—	Fatty diarr. Hyp.
		20/1/26	41			anæmia. Tetany.
2	32 M.	21/1/25	40	29/2/28	÷18·3	Fatty diarr.
		13/2/27	54			Anæmia.
		14/1/28	50			
		24/9/28	39			
3	54 M.	29/5/25	55	29/8/25	+19·7	Fatty diarr.
		21/3/28	53		+21·0	Hyp. anæmia.
						Tetany.
4	38 F.	3/11/26	39	19/5/28	+16·3	Fatty diarr.
		4/11/26	38			Anæmia. Tetany.
		21/1/28	37			Pigmentation.
5	43 F.	26/10/27	20	22/3/27	+43·0	Fatty diarr.
		6/1/28	28	15/5/28	+30·8	Anæmia.
		7/2/28	27		+30·8	Pigmentation.
		28/6/28	40			
6	57 F.	14/10/26	82	25/5/29	+17·8	Previously:
		4/2/28	84		+22·3	Fatty diarr., hyperchromic anæmia and glossitis.
7	56 F.	21/1/28	84	19/6/28	+12·8	Ditto.
		16/2/28	73		+11·6	
8	33 F.	11/9/26	6		÷ 7·3	Fatty diarr.
	Holst	25/9/26	27		÷11·0	Hyperchromic
						anæmia. Glossitis.
9	11 F.	15/2/28	17	12/3/28	+43·0	G.-H. dis. Tetany.
		16/2/28	12			Pigmentation.
10	4 M.	21/8/28	31			G.-H. dis.
		3/10/28	16			
11	7 F.				+19·6	G.-H. dis. (Schaap).
12	8 F.				+33·9	Ditto.
13					Normal.	G.-H. dis. (Lehndorff-Mautner).
14	47 M.	12/8/27	21	16/5/28	+12·6	Tropical sprue.
		3/1/28	51		+13·6	Tetany.
15	49 M.	12/1/25	63			Tropical sprue.

Diarr. = diarrhœa. Hyp. = hyperchromic.
G.-H. dis. = Gee-Herter's disease.

Table II. gives a survey of the blood-sugar findings in 12 patients. Nos. 6 and 7 had almost recovered and their blood-sugar curves were normal. Of the remaining ten patients eight (Nos. 1, 2, 4, 5, 8, 9, 10, 14) showed a low blood-sugar curve. In three cases (Nos. 1, 2, 14), however, the low blood-sugar curve was less constant, as examinations here sometimes showed a rise higher than 40 mg. per cent. Nevertheless, in all cases the higher rise occurred at times when the condition of the patient had improved considerably. Patient No. 5 likewise shows a higher rise in a good period (about 40 mg. per cent.) than was found on the three preceding examinations, which all were made during a poor period. These findings, together with the normal blood-sugar curves in greatly improved patients (Nos. 6 and 7), indicate that this abnormality subsides with recovery. Investigations that are still being carried on to explain how the low blood-sugar curve is brought about have shown its origin to be the same in sprue as in Gee-Herter's disease, and that it is not due to lowered absorption of the ingested glucose.[34]

The other metabolic abnormality common to sprue and Gee-Herter's disease is change in the basal metabolism. Of 12 patients examined one case of Gee-Herter's disease has once shown a normal basal metabolism (Lehndorff and Mautner), two cases of non-tropical sprue (Nos. 2 and 8) showed the basal metabolism to be lowered as much as 18 per cent., while the remaining cases showed an increase of the basal metabolism reaching as high as 43 per cent.

The objections, therefore, that have been raised against the view that sprue and Gee-Herter's disease are nearly related—probably identical—diseases are of no significance, and the low blood-sugar curve and the abnormal basal metabolism contribute further towards establishing the identity of these two lesions.

Conclusions.

The recognition and correct interpretation of non-tropical sprue forms the connexion between Gee-Herter's disease and tropical sprue and contributes towards establishing the near relationship, nay, the probable identity, of these diseases. Judging from the clinical manifestations, Gee-Herter's disease is just as identical with tropical sprue as is non-tropical sprue; the most conspicuous differences—infantilism, the rare occurrence of a pernicious blood picture and the frequence of halisteresis in Gee-Herter's disease—are readily explained by the fact that this disease is described in children. No one has suggested that these symptoms argue against the identity of these diseases. Gee is most likely right in grouping these conditions under one term—"the cœliac affection"—as representing the same lesion, but as long as their ætiology is unknown and their pathogenesis is obscure, it might be more correct to classify them as a special group of diseases, so as to emphasise their near relationship rather than to insist on an identity no one can prove. I have called this group "the idiopathic steatorrhœas" in order to emphasise that the chief symptom of the disease in its origin differs from those of the better-known forms of steatorrhœa: the pancreatogenous, the acholic, and, most likely, also of the enterogenous fatty diarrhœa.

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Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

AT a meeting of this Section held on May 17th the chair was taken by Dr. J. S. FAIRBAIRN, the President, and a short note was communicated by Mr. HERBERT SPENCER on

A Straight Rod Pelvimeter.

This, he said, was a simple instrument which, when carefully used in a patient fixed on a level steady table, gave an accurate measurement of the true conjugate. The device consisted of a straight rod, pointed at one end and rounded at the other, with two uprights.

Mr. G. I. STRACHAN then read a paper on

Contra-indications to Irradiation in Carcinoma of the Cervix.

He said that such impressive results had been obtained by certain workers that in a number of centres radium was now used exclusively, but opinion was sharply divided on the wisdom of this procedure. In inoperable cases radium was now used to the exclusion of other methods and in many instances growths had disappeared temporarily or permanently. The idea had therefore got abroad that any inoperable case could be treated with radium. This was incorrect; unless cases were properly selected the patient might be made worse. There were five definite contra-indications.

1. An extreme degree of general emaciation and cachexia usually meant a foul surface to the growth, extreme anæmia, and massive extensions; in these cases radium was likely to produce a rapid deterioration and early death.

2. Extreme anæmia with a red cell count of less than three millions or a hæmoglobin index below 40 contra-indicated radium, which in itself tended to produce some anæmia.

3. Extensions and metastases might be contra-indications. Radium should not be applied if hydronephrosis or pyonephrosis was suggested by the presence of a tender swelling in the loin, for this implied ureteral involvement and obstruction, and radium would only increase the obstruction by causing fibrosis in the broad ligaments. Extensions to bladder or rectum, as shown by frequency, dysuria, rectal tenesmus, or induration and fixation, would require the insertion of radium needles dangerously close to bladder or rectal wall, hastening fistula formation. Fistulæ were absolute contra-indications, for radium caused sloughing and enlarged the opening.

4. Any inflammatory pelvic lesion, such as a foul sloughing condition of the growth, would mean massive necrosis under radium, with toxæmia and the likelihood of pelvic parametritis or peritonitis. Pyometra was equally important, and an attempt should always be made to pass a sound through the cervical canal before radium was inserted. If a thin stream of pus escaped the uterus should be drained before inserting radium. There was risk of peritonitis if radium was used in the presence of salpingitis, pyosalpinx, or pelvic abscess. Suspicion should be aroused by severe pelvic pain, tenderness and fullness in one or both lateral fornices or behind, with a persistent temperature up to 101°F. These inflammatory complications were more common than was generally recognised, and were difficult to feel even under anæsthesia if there was much parametric thickening.

5. Where the whole pelvis was caked and infiltrated by extension a local remedy like radium could do little good, and it was better to leave the patient in peace.

6. Any evidence of impaired metabolism, especially defective excretion of nitrogenous waste products, was a danger signal, and radium should be withheld.

These contra-indications were of two types—the temporary, which cleared up under appropriate treatment, and the permanent ones like ureteric involvement or extension to bladder and rectum. In the former case radium could be applied when the contra-indication had been removed. An indiscriminate application of radium to these cases had led to unfortunate and sometimes disastrous results. Radium should only be used by those who had had special study and experience.

The PRESIDENT agreed that grave cachexia was a very important contra-indication.

Mr. MALCOLM DONALDSON feared lest the wave of enthusiasm for radium should result in a following wave of depression and depreciation.

Dr. EDGAR HAYDON spoke of the serious anxieties of the irradiator, and mentioned that a small surface dose would often enable him to find the cervical canal amidst much sloughing. The dangers of salpingitis could not, he thought, be over-estimated.

Mr. VICTOR BONNEY read a paper on the

Results of Surgery Compared with the Results of Radium in Carcinoma of the Cervix.

Up to the end of 1923 he had performed Wertheim's operation for carcinoma of the cervix on 265 patients out of 420 seen. There were 105 five-year survivals, so that his relative cure-rate was 39·6 per cent. and his absolute cure-rate 25 per cent., and these figures would be higher but that for the purposes of the present comparison he had reckoned as dead of cancer 21 cases who had either been lost sight of or died of some other disease before their five-year cure period was up. Of the 265 patients operated on the regional glands removed were carcinomatous in 113 and not carcinomatous in 152, giving a gland-involvement rate of 42 per cent. Of the 113 whose glands were carcinomatous, 27 survived their operations five or more years, a cure-rate of 23·8 per cent., whilst of the 152 whose glands were not carcinomatous, 78 survived their operations five or more years, a cure-rate of 51·3 per cent.

In comparing the results of surgery with those at present obtainable by radium it was necessary to emphasise what was not generally appreciated—that the scope of radium applied from the vagina was no wider than that of surgery, because radium applied that way did not reach out to the regional glands. Out of every hundred unselected patients presenting themselves at a radium clinic roughly 40 were certainly beyond the scope of radium, for at least that number had carcinomatous glands by the time they presented themselves. On the other hand, out of every hundred unselected patients presenting themselves at a surgical clinic, roughly 40 also were beyond the scope of surgery on account of gross extension of the growth to parts operatively irremovable. These two groups of 40, however, were not identical, for that which was beyond the scope of radium included certain cases not beyond the scope of surgery, and that which was beyond the scope of surgery included certain cases not beyond the scope of radium. The surgeon could distinguish the 40 per cent. beyond the scope of surgery, for he could open the abdomen to make sure, but the radiologist was at the disadvantage that he could not detect the cases that made up the 40 per cent. refractory to radium and hence had to treat them, though all unknown to him, failure was fore-fated.

By either method, therefore, only somewhere about 60 cases out of every 100 presenting themselves unselected beforehand could be treated with more or less chance of success.

Results Compared.

The radiological figures he would contrast with his own five-year results were those of Heyman from the Radiumhemmet at Stockholm and those of Gray Ward from the Women's Hospital, New York, for they were the most favourable to radium yet published. Heyman's figures related to the cases he treated from

1920 to 1923—i.e., after operative treatment had been abandoned by the Swedish surgeons, so that they represented an unselected series, and the same applied to Gray Ward's as he had abandoned operation.

It had been objected that comparison between surgery and radium was vitiated because radiological clinics got sent to them a larger proportion of patients with advanced disease than did surgical clinics, but this objection disappeared in communities where operation had been entirely superseded by radium, for the cases then presented to the radium clinic became as representative of the cases in the community at large, as were the cases attending a gynæcological clinic. That the average advancement of the growths in Heyman's and Gray Ward's cases was about the same as that of the cases presenting themselves at an ordinary gynæcological clinic was shown by the fact that the proportion of cases *in extremis* (i.e., unsuitable for radium) in their series was no larger than that encountered by the gynæcologist.

The comparative figures were as shown in Table I.:—

TABLE I.

—	Cases seen.	Five-year survivals.	Absolute cure-rate (per cent.).	Cases treated.	Five-year survivals.	Relative cure-rate (per cent.).
Bonney ..	420	105	25	265 operations	105	39·6
Heyman ..	467	106	22.7	444 radiated	106	23·8
Gray Ward ..	138	31	22·4	134 "	31	23·1

The last of these comparisons was unfair to radium. for he, the speaker, had operated on only 63 per cent. *of his patients, whilst Heyman had radiated 95 per* cent. of his, and Gray Ward 97 per cent. of his, and it was obvious that the cure-rate would be the higher the smaller the percentage of cases treated.

The Radiological Operability Rate.

In the endeavour to make comparable the results attained respectively by surgery and radium, the patients treated by radium had been clinically classified into four groups of which the first two comprised those in whom the growth was limited to, or had only slightly passed beyond, the cervix. These cases were termed "operable," and their proportion to the total number of cases radiated had been called the "radiological operability rate." It bore, however, no relation to the operability rate of surgery, which was the proportion the number of patients operated on bore to the total number of cases presenting themselves. Moreover, operation was by no means always barred by wide extension of the growth, and the result was that the "radiological operability rate" was always much lower than the surgical operability rate, so that when the results of the cases styled "operable" by the radiologist were contrasted with the results of the cases operated on by the surgeon the latter were prejudiced, as shown in *Table II.*

TABLE II.

—	Cases treated.	Percentage of total cases.	Five-year survivals.	Cure-rate (per cent.).
Bonney ..	265 operated on	63	105	39·6
Heyman ..	186 } Cl.1 and 2 {	39	76	40·8
Gray Ward..	32 } radiated {	23	17	53·1

Results in Gland-free Cases.

It was possible, however, to make a much fairer comparison by contrasting the results he, the speaker, had obtained in his group of gland-free cases operated on, which represented a selection of 36 per cent. from all the cases he had seen, with the results Heyman and Gray Ward had obtained from their class 1 and 2 cases which represented a selection of 39 per cent. and 23 per cent. from all the cases they had seen respectively (Table III.).

TABLE III.

Gland-free cases operated on.	Per cent. of all cases.	Five-year survivals.	Cure-rate (per cent.).
Bonney: 162	36	78	51·3
Class 1 and 2: Cases radiated.			
Heyman: 186	39	76	40·8
Gray Ward: 32	23	17	53·1

There was a further method of statistical comparison that had the advantage of throwing some light on the question as to which cases are most likely to be cured by operation and which by radium. Out of every 100 patients presenting themselves to Heyman and Gray Ward respectively, only 60 (i.e., those whose glands were uninvolved at the time they presented themselves) were within the scope of radium treatment, whilst of those who presented themselves to him, the speaker, 63 out of every 100 were able to be operated on. Out of the 444 cases presented to Heyman, therefore, only 266 were in reality treatable by radium with any chance of success, and of Gray Ward's 130 only 82. Regarded in this way the figures worked out as shown in Table IV.

TABLE IV.

Cases presented.	Cases within scope.	Percentage of total cases.	Five-year survivals.	"Scope" cure (per cent.)
Bonney: 420 ..	265	63	105	39·6
Heyman: 467 ..	280	60	106	37·8
Gray Ward: 138 ..	82	60	31	37·7

This calculation showed that supposing it were possible to limit the use of radium to cases in which the glands were uninvolved the percentage of cures it would effect relative to the number radiated would be about the same as those effectable by surgery operating on both gland-free and gland-involved cases relative to the number operated on. Moreover, if one assumed for simplicity a gland-involvement rate of 40 per cent. for all the cases presented to himself, Heyman, and Gray Ward, then of the 420 cases presented to him 252 were gland-free and of these he cured 78, whilst Heyman, out of 266 gland-free cases, cured 106 and Gray Ward out of 82 cured 31, showing that if there were no such thing as glandular involvement radium would give better results than surgery. It was on the gland-involved cases that surgery attained its numerical superiority in absolute-cure-rate over radium, for all these cases were beyond the scope of the latter. Table V. made this clear:—

TABLE V.

—	Total cases seen.	Gland-uninvolved cases = 60%.	Cures.	Rate (per cent.).	Total cases seen.	Gland-involved cases = 40%.	Cures.	Rate (per cent.).
Bonney ..	420	252	78	30·9	420	168	27	16
Heyman ..	467	280	106	37·8	467	187	0	—
Gray Ward	138	82	31	37·7	138	56	0	—

Conclusions.

The figures and considerations he had put before them showed that the results he had obtained by Wertheim's operation were numerically better than those obtained by Heyman and Gray Ward by radium. It should, moreover, be remembered that, owing to the facilities enjoyed by the Radiumhemmet, none of Heyman's patients had been lost sight of, whereas he had lost sight of 13 patients, all of whom were counted for the purposes of this comparison as having died of recurrence. If amongst these 13 cases lost sight of there were only 5 five-year survivals (which was probably an under-estimate) he had really cured 110 out of the 265 cases he had operated upon. Moreover, his figures included patients operated on many years ago when his operative mortality-rate was 20 per cent. instead of 11 per cent. as it stood to-day for his last 100 cases.

Inoperable Cases.

He had kept no record of the 155 cases which he had to abandon as inoperable. Some were abandoned before radium came on the scene, and though many of those who came after were treated with radium it was at a time when the results of radium therapy were far different from what they are now. But the point was that, had he been able to treat these abandoned cases by radium in the same manner as they would be treated now, a certain proportion of them would have been cured. Heyman, between 1914 and 1916, had 17 cures out of 97 "inoperable" cases treated by radium; so that out of his, the speaker's, 155 inoperable cases somewhere between 15 and 20 should have been cured, which, together with five cures out of the 13 cases lost sight of, would have raised the total number of cures effected by him from 105 to between 125 and 130 out of the 420 cases originally presenting themselves—a result far superior to anything afforded up to the present by radium treatment alone.

Mr. Bonney said that he had dealt solely with the results of operation on the one hand and radium applied from the vagina on the other, for no evidence was yet available as to the results capable of being attained by radium applied through the abdomen as well as through the vagina, or of radium applied through the vagina in combination with operative extirpation of the regional glands. The latter appeared to him to combine the advantage surgery possessed in being able to reach out to the regional glands with the advantage that radium possessed in being able to ablate the local growth without resulting deformity and without injury to the bladder and rectum when these were involved. A good many years, however, must elapse before judgment on these matters could be passed. At the present time, in spite of the improved results of radium treatment, a greater number of lives could be saved by subjecting to operation all patients whose growths were removable by an expert in this branch of surgery, and treating the remainder by radium, than by using radium to the exclusion of surgery.

Discussion.

The PRESIDENT said he was glad Mr. Bonney had made out such a good case for surgery, since there was a danger that the pendulum would swing too violently to the side of radium.

Dr. SIDNEY FORSDIKE said that Mr. Bonney's figures were not comparable with any save those of the Wertheim clinic, but was he content with a 25 per cent. cure rate? Surgery had shot its bolt in the treatment of carcinoma of the cervix, but there was no doubt that the pendulum was swinging too rapidly. The practitioner who wished to apply radium must study for several years if he wanted satisfactory results. In a certain percentage of cases, where the only finding after treatment was a thickening in the vaginal roof, recurrence took place high up in the pelvic glands; for these radium must fail.

Dr. A. J. WRIGLEY showed graphs of the results obtained at St. Thomas's Hospital on 148 cases treated from 1918–1922. The five-year cure rate was 15 per cent. Eighteen per cent. of the cases had been considered operable, 20 per cent. borderline, and the rest inoperable. The end-results for the operable and borderline cases were about 10 per cent. better than Heyman's, but so much depended on the estimate of operability that this figure did not count for much. Cases had been treated either by Wertheim's operation or by total hysterectomy followed by radium. The former group showed slightly better results for the borderline cases, and the latter for the "operable." Of the inoperable, those untreated were all dead in 18 months, and most of them in 6 months. Of those treated with radium, half lived four months longer, but of the minority who survived the rate lengthened to four and a half years. Radium needles had only been in use three and a half years, but the survival rate curve, if continued to the five years, would be a little below Heyman's 13 per cent.

Mr. HERBERT SPENCER stressed the importance of knowing the meaning of "operability."

Mr. DONALDSON said that it was very difficult indeed to compare results of radiation and operation, and that only the absolute cure rates were comparable. It was a very big assumption that the same type of case went to Bonney as to Heyman. Radium was in its infancy, and much better figures would be obtained in the course of the next five years.

Mr. WILLIAM GILLIATT said that since 1923 he had treated all cases with radium, submitting the operable one to a Wertheim operation four to six months later. He had been struck by the small amount of operative difficulty caused by the radium. The patients did much better than those not treated by radium, and the fear of vaginal complications was much reduced.

Mr. D. C. L. FITZWILLIAMS said that Mr. Bonney's figures had proved that radium did almost as well as surgery, and, moreover, it must be remembered that radium figures were based on the work of pioneers. The operative and survival rates obtained by Lawson Tait would shock any hospital board to-day. The great radium centres had become stereotyped; radium ought to be distributed to many more centres and the advance would then be rapid.

Reply.

Mr. BONNEY, in reply, said he had tried to put the case fairly. His figures were not exceptional. The surgeon needed to treat a much smaller proportion of the cases presented to him than did the radiologist in order to obtain the same number of cures, and from the unoperated-on remainder rather over 10 per cent. of cures could be obtained by radium according to the latest figures of Heyman that he had given, whereas the radiologist had no residuum, having used up his stock of material in obtaining his results. The wave of enthusiasm for radium was very foolish and bound to be followed by disappointment. Far greater skill was required to get good surgical results than to get good radiological results. He had only one standard of operability—could he get the thing out?—and he operated up to the limits of possibility. The choice was not between surgery and radium but between surgery with radium and radium alone. His own operability rate was founded on an accurate computation at a time when the cases presented to him and Mr. Comyns Berkeley formed a sample of the cases in the community at large.

SECTION OF TROPICAL MEDICINE.

AT a meeting of this Section held on May 15th the chair was taken by Dr. J. B. CHRISTOPHERSON, the President. The Secretary, Dr. W. BROUGHTON-ALCOCK, communicated a paper by Prof. A. BESREDKA on

VACCINE THERAPY.

The power of antivirus to act directly and specifically on receptive skin cells had been shown, he said, by the well-known experiments on anthrax, and its value had now been extended to the cells of the alimentary tract. Vaccine treatment by the mouth had reduced the morbidity and mortality from dysentery when used prophylactically and therapeutically. It was as effective as serum, if not more so; it was never contra-indicated, was easily applied, and caused no unfavourable results. Of 3000 men treated in the Rhine Army none contracted dysentery, while 471 cases occurred among untreated men. For typhoid, oral vaccine had taken its place as ordinary practice. Of 4140 men treated with oral antivirus preceded by bile, not one developed typhoid; of 549 treated without bile 0·07 per cent. were affected. Oral vaccination was the only method adapted to rapid immunisation of large communities. Therapeutically applied, it could prevent the gradual encroachment of the *Bacillus typhosus* on cells which were still healthy, and cut short the period of illness. Moreover, the patient so treated would not become a carrier. Extensive experiments in Russia, Germany, France, and India had shown that the treatment was equally valuable for cholera and entero-colitis. Our ignorance of the intestinal flora in the latter condition was a great obstacle to progress, but the results were too good to be disregarded. Chronic diarrhœa in children yielded rapidly to oral antivirus, and the results in severe colitis were notable. Very good results had been obtained in pyelonephritis, but when a renal lesion was present as well as intestinal disorder, the oral treatment should be supplemented by instillation of antivirus into the renal pelvis and bladder. Of 31 cases of pyelonephritis, most of them previously treated unsuccessfully with hexamine and stock subcutaneous vaccine, only 11 had proved resistant to antivirus. Acute cystitis was relieved after four or five instillations, but chronic cystitis required 10 to 15 daily treatments. The results in urinary sepsis were very good and occasionally even remarkable.

Antivirus in the Eye, Nose, Throat, and Ear.

The eye had a greater degree of autonomy than any other organ; eye diseases rarely influenced the rest of the body, and the eyes were usually unaffected by general immunities. Immunity of the cornea did not even extend to the anterior chamber, but was confined to the cells which had actually been in contact with the immunising agent. Ordinary inoculation was useless to the ophthalmologist, so that he welcomed local immunisation which, used systematically and early, would undoubtedly save many eyes. The best results had been obtained in blepharitis, conjunctivitis, ulceration of the cornea, and dacryocystitis. Sometimes a temporary aggravation followed the treatment, but this could be overcome by bathing with sterilised water and was usually followed by speedy and complete recovery. Simple instillation usually gave good results, but the antivirus could also be applied on a pomade with vaseline and lanoline. Autogenous preparations were better than stock ones. Local vaccine had a startling effect on furunculosis of the ear; the introduction of a wad of cotton-wool soaked in antivirus immediately reduced the pain, while swelling and redness disappeared in a few days and the expulsion of the core was accelerated. For otitis media 10–15 drops should be instilled into the ear, and a gauze lampwick soaked in vaccine should then be put in place. One case of chronic otitis media had been cured in 20 days, and it was reasonable to hope for more results when the flora of this condition was better known. In nasal infections subcutaneous vaccine was useless, and disinfectants could not be expected to do good when they acted on the surface only and weakened the mucous membrane. Local vaccine treatment was, however, very successful; it established a strong osmotic drainage as soon as the wicks were withdrawn together with the accumulated pus. This hypersecretion swept all before it and shortened both acute and chronic stages of sinus disease. Where surgery was unavoidable, pre- or post-operative use of the virus was valuable. Ozæna was usually regarded as insusceptible to treatment, but antivirus had given very favourable results. For chronic laryngitis the treatment could be applied directly by means of a vapouriser several times daily. Intratracheal applications were being more and more used, especially for pulmonary gangrene and bronchiectasis. Some day it might be possible to dry up, if not to cure, tuberculosis. Ulcerative stomatitis, gingivo-stomatitis, suppurative gingivitis, glossitis, acute periostitis with abscess, and alveolitis after extraction could all be treated by injection of antivirus into the tissues or by dressings. Neuralgia was stopped in about two hours, always within 12 hours; suppuration cleared up in a few days and splinters were expelled. Antivirus acted with peculiar speed and thoroughness where classical treatment was useless or very slow in action. The results of its use in pyorrhœa alveolaris had been very satisfactory.

Antivirus in Gynæcology and Dermatology.

The use of antivirus in pelvic conditions was in its infancy and each worker had his own way of applying it. Improvement had been recorded in metritis, alone or with extensions to surrounding parts. For the former, ovules or compresses were applied to the cervix, and for the later intradermic antivirus was applied to the lower abdomen. It could be used preventively or curatively for puerperal conditions and for mastitis. It provided the most rational procedure for the prevention of breast abscess. It gave most encouraging results in pyodermatitis, lessening suffering, permitting return to ordinary life, and guarding against relapse. Hundreds of boils and carbuncles had been treated by antivirus, on dressings or intracutaneously. Impetiginous abscess, sycosis, acne, sores, burns, and erysipelas yielded to it. Buboes were better in 24 hours and healed in four days if they were punctured and the released pus replaced by antivirus. Soft chancre turned to a healthy looking sore. Local vaccine treatment of urethritis encountered difficulties on account of the anatomy of the parts. Results had been uneven in the male, but good in the female, even after other methods had proved useless. Antivirus therapy was being used more and more in surgical cases before, during, and after operation, especially for intervention in septic organs. It had also endless scope in veterinary practice.

The Case against Antivirus.

General W. F. **Harvey** said it was difficult to know exactly what Prof. Besredka meant by antivirus; sometimes he spoke of it as specific; sometimes as non-specific; sometimes as if it acted on the cells, and at other times as if on the bacteria; sometimes as if it were dead; and at other times as if it were living and capable of multiplying and penetrating tissues. The method had been used in the army for gonorrhœa, and centrifugalised washings of young cultures had been found better than old ones. Intradermic use was giving quite good results. Oral vaccination for intestinal disorders had been tried in the army 20 years ago, and the investigators had at that time concluded that the production of antibodies in the blood was very irregular; agglutinins were never produced. Antivirus had been used for dysentery in the Shanghai Expeditionary Force, but unfortunately the method was so harmless that nobody would consent to act as controls, and the 5000 men had all had it. In the first season there had been 28 cases of dysentery, and in the second season 48 cases of proved dysentery and 400 of enteritis. These patients had undoubtedly had antivirus, so that the protection was not complete.

Prof. **Alexander Fleming** agreed that it was difficult to discover what antivirus was. Prof. Besredka seemed to ascribe the inhibitory action of old broth culture to some specific antibody; in the past it had been thought to be due to exhaustion of food substances or accumulation of waste products. In some cases the latter was undoubtedly the cause. There were probably many factors contributing to the end-result. Prof. Besredka seemed to expect antivirus to penetrate where antiseptics would not go—e.g., to the nasal submucosa—and spoke of an "osmotic drainage," which suggested a process other than that of immunisation. He claimed wonderful results for this exhausted broth, but relied chiefly on clinical reports by workers not under his own supervision. Clinical reports, as every advertiser knew, could be obtained. A number of people had produced evidence that applications of ordinary broth had the same effect as antivirus, both acting by attracting phagocytes in large numbers. Prof. Fleming had recently grown a certain mould in broth and found that after about ten days the broth developed an inhibitory action on pyogenic cocci, even in considerable dilutions. The results of applying this broth to suppurative conditions were as good as, if not better than, those cited by Prof. Besredka. There was no specific immunising effect at all. The medium used in antivirus treatment might have more implications than any specific immunising action.

Prof. J. C. G. Ledingham contributed a paper (read by the President) in which he said that only the experienced clinician, trained to evaluate data from many therapies, could wisely assess Prof. Besredka's results. In scarcely a single particular had his views of the action of antivirus been accepted. The skin of laboratory animals could be so treated by specific and non-specific means as to withstand and localise infections of low virulence. If the infection were highly virulent only the specific antibody would produce immunity. Poultices impregnated with ordinary broth could make a skin area an unsuitable medium for any infection. Their action was probably twofold: increase of vascularity, bringing more antibody from the general circulation, and stimulus to the local reticulo-endothelial cells by the small amount of antigen present. The local defences at various points varied greatly in intensity, but all parts were vulnerable if a sufficient dose of infection were introduced. Oral vaccination could give some immunity against intestinal infections, but it was doubtful if this could compare with an adequate dose of vaccine subcutaneously.

Dr. Graham Forbes said that many people had been unable to repeat Prof. Besredka's results with dysentery, but rhino-inoculation gave better results and was especially suitable for hypersensitive and delicate infants. It might prove valuable for nasal diphtheria and carriers.

Dr. Dennis Embleton said he had tried repeatedly to obtain results from antivirus treatment and had failed. The paper had consisted of extravagant claims for treatment and some claims for prophylaxis; these two parts should have been kept separate. The work had not been brought forward in a scientific manner; claims had been based on small series of cases. The paper ought not to have been brought forward and fathered by the Society in this way, for it might carry weight with people who could not judge and estimate the value of the work.

Dr. Broughton-Alcock remarked that antivirus had had an extensive trial and there was a good deal of literature about it.

Dr. H. S. Stannus commented on the lack of first-hand information about antivirus and said there should be more before the method was condemned, and Dr. Embleton explained that he had not intended to condemn the method, but only its form of presentation that evening, which was not such as to carry conviction.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.

A meeting of this Society was held in London on May 3rd, with Colonel L. W. Harrison in the chair. A paper on

Vasostomy and its Place in the Treatment of Early Urethritis

was read by Mr. Frank Kidd, who said the operation had not yet been practised in this country, though it was projected in 1905. Until 1928 Mr. Kidd had reserved it for chronic cases of vesiculitis. He had been struck by letters to The Lancet (1928, i., 883 and 989) last year from Mr. Peart, who said he had employed vasotomy with satisfactory results. Criticisms on a priori grounds had followed in the correspondence columns, but they were by people who had not had experience of the procedure. Mr. Kidd had long noticed that many cases of early urethritis presented themselves in which the condition was confined to the anterior urethra. But after a week or two of irrigation, when all signs of discharge had disappeared and the urine was clear, it suddenly became hazy, with the supervention of acute prostatitis and vesiculitis, which required several months of treatment. In a number of cases he thought a quiet ascent of gonococci took place, the organisms lying dormant in the prostate or epididymis for some weeks before either manifesting their presence or dying out. In some cases, he suggested, if the patient indulged in alcohol or venereal excess, or had influenza, or treatment was too strong, though the anterior urethritis disappeared, the resistance of the deeper tissues broke down, bacteria came through, and the result was violent deep urethritis, prostatitis, vesiculitis, and even epididymitis. In these cases it seemed quite reasonable to cut down and fill each vesicle with colloid silver, or any other substance which would bring about complete and quick destruction of the organisms.

Though it was not easy to persuade patients who suffered from early gonococcal urethritis to submit to vasostomy, he had dealt in this way with five selected cases at St. Paul's Hospital, and observed the final results. Three were cases of early acute posterior gonococcal urethritis. The first had had his trouble a little over a fortnight, and had developed a deep posterior haze and a swollen, tender prostate. Mr. Kidd cut down on each vas, and washed out each vesicle with 5 c.cm. of a 5 per cent. solution of colloid silver. Daily posterior irrigation with weak permanganate was given for three days. He left the hospital and had no treatment of any kind since. He was followed up for three months and was found to be cured. Never before had the speaker seen acute posterior urethritis cured in three days by any method. The second patient had posterior urethritis, with swollen prostate, as a result of contact 13 days previously. Posterior daily irrigation was given for nine days after the operation, but Mr. Kidd was unable to follow up the case. At the ninth day gonococci could not be detected in the urethra, and there was no discharge. The third case was very dramatic. Acute gonorrhœa was contracted on June 4th, 1928, and on the 18th the patient was admitted into St. Paul's Hospital with profuse hæmaturia, strangury, and greatly increased frequency of micturition. Each attempt at irrigation brought on hæmaturia, therefore he was left in bed for a time. On July 11th, as no progress was being made, Mr. Kidd cut down on each vas and washed out each vesicle with colloid silver. Three hours after the operation pain, frequency, and hæmorrhage had vanished, and urethral discharge disappeared the next day. Sometimes in chronic cases, after washing out a vesicle, there was still some pus, and the vesicles were somewhat thickened, but no gonococci were found. The next patient had had gonorrhœa two months; he had had the disease twice in the past, each time with some arthritis. Mr. Kidd washed out the vesicles with 5 per cent. colloid silver, and afterwards gave posterior irrigation with permanganate once daily for eight days. The discharge disappeared but the patient still had fever, so 1 c.cm. of symmetrical urea products ("s.u.p. 36") was injected intramuscularly on three successive days. On the twelfth day the fever had wholly departed, there was no discharge, the urine was clear, and the joint trouble cleared up. He was kept under observation until the twentieth day, but without further treatment, and he went out with no discharge and the urine clear. Another case was that of a man aged 68 who contracted severe gonorrhœa. His doctor had failed to carry out irrigation properly; the only result of it was to project other germs into the urethra, including *B. coli*, and the discharge became severe. Mr. Kidd, under local anæsthesia, washed out each vesicle through the vas, and the patient was irrigated daily for a week. The discharge disappeared, but the urine remained hazy for some weeks, though no more gonococci or further discharge were to be seen.

Irrigation was discontinued, and hexamine was administered, and then the case cleared up.

Mr. Kidd submitted that, small as was the total number of cases brought forward by Mr. Peart and himself, the results justified further research and comparison of notes. Surgeons in the Services enjoyed good opportunities for carrying out this treatment, which produced such rapid results in suitable cases. Then the question of ensuring a continuance of treatment while on board ship or on foreign service would not arise. He did not advocate it for every early case, as many cases of anterior urethritis reacted quickly to irrigation, controlled by the urethroscope. There were also many posterior cases of urethritis which reacted in two or three months to prostatic massage and posterior irrigation. But he was sure that in a large number of cases this operation of vasostomy would be of distinct use. Certainly it would enable the medical man to tide over the acute embarrassment of a man returning from abroad with the disease who was expected quickly to rejoin his wife; also for the young who became infected shortly before marriage. He intended to use the operation more in joint cases, as it seemed to him the quickest way of clearing up the joint condition. When vasostomy was contemplated it was essential to put the patient to bed for at least three days; a week in bed was better. There was a temptation, especially in America, to do the operation in out-patient departments and under local anæsthesia, allowing the patients to walk. In Mr. Kidd's opinion that was a mistake. And during the days that the patient remained in hospital posterior irrigation should be carried out. Pyuria and haze in the urine should not cause discouragement; they might result either from chemical irritation or from secondary infections. The operation was more difficult under local than under general anæsthesia, at least at first. When he did it in 1923 he left the vas exposed, but he had discontinued that, as it was difficult to get a second or a third wash through.

The operation involved some risks, but they were not common. If the vas was not carefully stitched up a leakage of colloid silver would occur, and the consequent irritation might result in the formation of a stricture at the site of puncture. A real stricture, if occurring on both sides, might mean sterility. Out of his 50 cases complaint of sterility had been made in only one case, and Mr. Kidd felt convinced that the man was sterile before the operation was done; certainly he was not a father. Perhaps it was better to puncture the vas with a needle, and not to cut it at all.

Discussion.

Mr. J. F. **Peart** said he had done vasostomy only twice, the last time a year ago, and in both cases the results had been dramatically good. The first patient had had gonorrhœa only seven days, but even then epididymitis was evident. The condition cleared up completely three days after operation. A month later the patient gave himself a severe alcoholic test, but no further signs of the disease appeared. The second case was a more serious one, as the patient had been acutely ill with gonorrhœa for three or four weeks before he was seen. The temperature was 101° F., and he had very acute epididymitis. When Mr. Peart was called in, he evacuated the epididymitis and injected the silver only on the affected side. On the day following the rise of temperature the discharge and the pain had disappeared. When seen a month later there were no gonococci. But he used, for both his cases, a much stronger silver solution than Mr. Kidd employed—namely, 20 per cent.

Mr. F. **Fowler Ward** spoke of having done vasostomy many times for chronic gonorrhœa. He was convinced of the value of the operation.

Mr. **Hugh Lett** thought the form of silver used possessed considerable power of penetration, and remained for some time in contact with the vesicles. The danger, as with every new method, was lest it should be used indiscriminately for every kind of case of the disease. A further real danger was that when the operation was done on both sides a stricture might occur on both sides. That alone would deter him from doing it except in very severe cases. If limited to the suitable type of case he regarded the operation as a very distinct advance.

Mr. V. E. **Lloyd** spoke of his experiments in injecting methylene-blue in the cadaver, remarking that he was led by these to conclude that some of the cases which reacted so well to silver preparations during life were infections of the ampulla of the vas rather than of the vesicles themselves.

Mr. G. E. **Neligan** said he had done vasostomy in three cases of chronic gonococcal infection of vesicles and prostate which did not yield to other forms of treatment. He deprecated doing it on any but carefully selected cases. He discussed the modus operandi of the silver preparation, and expressed some doubt that the injection described could directly cure epididymal orchitis.

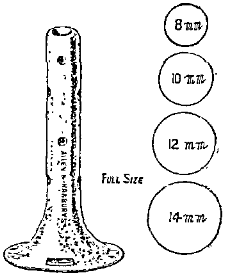
Mr. A. H. **Harkness** said that cases of acute posterior urethritis could usually be checked by giving local irrigations for 48 hours, followed by large doses of sandalwood oil.—Mr. **John Adams** asked how it was considered that cure of joint conditions was so quickly brought about by this treatment.—Dr. B. B. **Sharp** said he would hesitate to employ the operation except for chronic relapsing vesiculitis, which often caused despair.—Dr. E. G. **Ffrench** spoke of quick cures following vasostomy. Had this operation been known and practised during the war, many men could have been returned to the line weeks before they were sent.

Mr. **Kidd**, in his reply, said he was convinced that the arthritis in these cases was due to vesiculitis, and soon after the vesicles were empty the joint condition cleared up.

New Inventions.

DYSMENORRHŒA TUBES.

A dilatation of the cervix for dysmenorrhœa gives freedom from pain of the spasmodic type for only 12 to 14 months, as a rule. Stems have been used to ensure prolonged dilatation at the time of operation and are inserted for four to five days. Their use lengthens the time of freedom from recurrence of the pain. It was thought that the nest of stems, graduated to suit different sizes of uteri here illustrated, would be an improvement. They are silver electroplated on brass and of four sizes, 8, 10, 12, 14, corresponding to the sizes of Hegar's dilators. They are hollow, rounded at the upper end, and the wall of the tube is perforated with small holes. The base has two holes for the insertion of a withdrawal tape. They are long enough to occupy the uterine cavity and so straighten an acute antiflexion of the corpus uteri. The cervix and body of the uterus are dilated to the extent desired, and a stem the size smaller is inserted after steadying and exposing the cervical canal by vulsellæ on the anterior and posterior lips.



A nest of four of these is made and supplied by Messrs. Allen and Hanburys, Limited, Wigmore-street, London, W. 1.

W. McKim H. McCullagh, M.B., B.Ch. Belf., F.R.C.S. Eng.

Reviews and Notices of Books.

FRACTURES AND DISLOCATIONS.

Immediate Management, After-care and Convalescent Treatment, with Special Reference to the Conservation and Restoration of Function. Second edition, revised. By PHILIP D. WILSON, A.B., M.D., F.A.C.S., Instructor in Orthopædic Surgery, Harvard Medical School; and WILLIAM A. COCHRANE, M.B., Ch.B., F.R.C.S. Edin., University Tutor in Clinical Surgery, University of Edinburgh. London: J. B. Lippincott Company. 1928. Pp. 789. 45*s.*

THIS new edition of a work already well known has been brought thoroughly up to date by the inclusion of new methods and illustrations, and constitutes a worthy monument to the labours of the fracture service of the Massachusetts General Hospital. Containing, as it does, 1029 illustrations, all of them apt and admirably reproduced, it puts the subject of fractures and dislocations before the reader in a most attractive form. What a relief it is to find authors with the courage to discard illustrations and descriptions of time-honoured splints of bygone ages which still occupy space in our text-books, in our hospital splint stores, and even on our examiners' tables! Instead of these we are given admirable accounts of the use and application of methods of which the value has been proved by experiences of the war and the post-war period. The mechanism and anatomy of the various fractures are clearly described, and the appropriate means of reduction and fixation are detailed, but we feel that with the material on which the authors are able to draw more attention could with advantage be given to prognosis, a side of fracture work so important to the patient and so troublesome to the surgeon. The book is intended to meet the needs of the general practitioner, but we doubt whether many practitioners would be justified in attempting many of the methods described. The authors give to open operation in simple fractures rather grudging recognition. The advice that "when metal plates, screws or bands are used it is advisable in all such instances to remove them at a later period when union has been obtained" is surprising. The reason given—"that the presence of such foreign bodies in contact with bone is apt to be harmful in the long run, and may determine the development of a localised osteomyelitis or weaken the bone to such an extent as to result in fracture"—would place the technique of any less eminent surgeons than the authors under suspicion.

Minor defects such as these only serve to emphasise the excellence of the work as a whole; it is one which all who have to deal with fractures will find invaluable. It is difficult to know whether the publishers are to be more congratulated on the reproduction of the illustrations or the authors on their selection, but the result makes one of the most readable works on fractures with which we are acquainted.

IMPERATIVE TRAUMATIC SURGERY.

With Special Reference to After-care and Prognosis. By C. R. G. FORRESTER, M.D., F.A.C.S., Consultant, Teaching Staff, Illinois Post-Graduate School, Laboratory of Surgical Technique, Chicago. New York: Paul B. Hoeber, Inc. 1929. Pp. 464. $10.00.

THE author explains that he has chosen his title as being more descriptive than the previously contemplated one of "Industrial Surgery." We might have forgiven, while still regretting, his second thoughts, but when we find him referring throughout his work to "the traumatic surgeon" and "traumatic surgery," and using the expression "surgically compounding a fracture" in reference to the use of the Steinman pin the effect is definitely irritating. The book itself deals mainly with the treatment of fractures and nerve injuries, and embodies Dr. Forrester's experience of 26 years devoted to this branch of surgery. The advice given as to treatment is clearly expressed, and considerable attention is paid to the prognosis of the various injuries, a matter of great importance in industrial accidents. On the whole the author employs a longer period of immobilisation than is usual in this country, but this is probably due to the type of patient with whom he is dealing. He shows considerable ingenuity in the methods he employs, and his results, which are presented with admirable candour, do great credit to the thoroughness of his work. The book is well illustrated and printed, with the exception of the reproductions of the author's fracture cards. These, of which some 70 are given, are far too small to be read without considerable discomfort, and while no doubt excellent as case sheets, it seems doubtful whether they are necessary in the presentation of details of cases in a work of this kind. We hope that Dr. Forrester, encouraged by the results of his first essay in authorship, will continue to write on surgical subjects; but we trust he will in future refrain from referring to himself or any other as a "traumatic surgeon."

A GRAPHIC GUIDE TO ELEMENTARY SURGERY.

By Prof. Dr. TH. NAEGELI, Bonn. Translated by J. SNOWMAN, M.D., M.R.C.P., with an introduction by Dr. C. GARRÉ, Bonn. London: John Bale, Sons and Danielsson, Ltd. 1929. Pp. 205. 12*s.* 6*d.*

THE object of this book is to present an introduction to surgery in pictorial form, with simple illustrations as the main feature, and the text reduced to a minimum. With such an object every teacher must be in sympathy, but the present volume scarcely attains its end. Upon the title-page we are informed that the book contains 322 illustrations (mostly coloured), but the illustrations are diagrams (of the utility of some of which we have grave doubts), and the colour consists in a crude use of red, yellow, and blue to emphasise points in the diagrams. The text is more satisfactory than the illustrations and constitutes an introduction to elementary surgery on orthodox lines. The translation is performed with Dr. Snowman's usual facility, but we doubt whether this book is likely to find favour with students in this country.

ELEMENTARY MEDICINE.

Aids to Medicine. Fourth edition. By JAMES L. LIVINGSTONE, M.D., M.R.C.P. Lond., Junior Physician, King's College Hospital, London. London: Baillière, Tindall and Cox. 1929. Pp. 414. 5*s.*

DR. Livingstone has succeeded in enclosing a surprising number of the medical facts that the student requires for qualification within the space of 414 pages. To decide what to insert and what to omit and to lay due and proportionate stress on individual diseases in such a small volume must have been a difficult task, and on the whole it has been well accomplished. There are some points to criticise. The Schick reaction is not mentioned. If adherent pericardium deserves one page, coronary thrombosis deserves more than four lines. The subject of gastric ulcer is introduced as follows: "The simple perforating ulcer of the stomach or duodenum occurs most commonly in girls between the ages of 15 and 25. . . . Predisposing features are chlorosis, dyspepsia, and constipation." The ordinary chronic ulcer is surely commoner in men, while the acute ulcer is not here described. The leukæmias are divided into three groups, the one acute form being described as having a white blood count "from 2000–50,000 almost entirely of the mononuclear variety—probably of myeloblastic origin." Although the acute forms are rare, we cannot see any justification in grouping acute lymphatic and acute myeloid leukæmia as one disease. Spinal cord tumours occupy 12 lines. More space could well have been given here, for a correct diagnosis may mean much more to the patient than in such conditions as the muscular myopathies which are given fair prominence. A chapter is devoted to a synopsis of the more common skin diseases.

The book is clearly and concisely written, and the treatment of conditions such as diabetes, pernicious anæmia, and peptic ulcer are supplied in a just and up-to-date manner. To those students who are accustomed to occupy themselves with a small book a week or so before an examination this one can be recommended.

Practice of Medicine. A Manual for Students and Practitioners. Fifth revised edition. By HUGHES DAYTON, M.D., Consulting Physician to the United Hospital, Postilaster, New York. Philadelphia: Lea and Febiger. 1928. Pp. 340. $2.25.

THIS edition has been revised and brought up to date. Additions include an outline of the Dick test in scarlet fever with some remarks on the use of serum in prophylaxis and treatment and a brief account of the use of insulin in diabetes mellitus. Descriptions of the more common affections of the upper respiratory and digestive tracts, which had previously been omitted for lack of space, have now been added. The book contains much essential information required by the student revising for a qualifying examination, and has the additional advantage that it is small enough to fit easily in the pocket, while the print is large and clear.

Elementary Medicine in Terms of Physiology. An Introduction to Clinical Work. By D. W. CARMALT JONES, M.A., M.D. Oxf., F.R.C.P. Lond., Professor of Systematic Medicine, University of Otago, N.Z.; Physician, Dunedin Hospital; Consulting Physician, Westminster Hospital. London: H. K. Lewis and Co., Ltd. 1929. Pp. 364. 12*s.* 6*d.*

ONE of the most critical periods in the career of a medical student is the time when he first begins his clinical work. Up to that period his energies have been chiefly devoted to the study of anatomy and physiology, physics and chemistry, only too often under the tuition of those whose interests in the practical problems of medicine are slight. When he goes into the wards the position is abruptly reversed. He is suddenly confronted with the problems of disease, often by teachers whose physiological interest and knowledge has been largely submerged in the study of pathological processes and symptoms. Because of this unfortunate arrangement the continuity of the medical curriculum may be lost, and also much of the knowledge painfully acquired during the first two or three years of the curriculum. Dr. Carmalt Jones has recognised this chasm and has attempted to bridge it in this book by building up the principles of medicine for the student on a foundation of physiology. The scope of the work is limited to the recognition of organic disease, for, as the author points out, the practical questions of treatment and prognosis and the scientific one of ætiology belong to a later stage in the student's career.

The book opens with a brief outline of the causes of disease, and this is followed by a short account of the methods of examination of the various systems. The common disease syndromes are then dealt with according to systems. Throughout the book the effect of pathological changes on the normal physiological processes are made the basis of the teaching. Explanations are in simple language, while only such details of pathology and bacteriology as are necessary for understanding a disease are included, and there is no discussion of ultimate ætiology. Naturally this method has involved arbitrary limitations in many directions. There is, however, much in the book which should help the medical student to make his physiology the basis of his medicine rather than, as it so often is now, a prelude which appears to bear no relation to the theme which follows it.

THROMBOSIS AND PHLEBITIS.

Phlébites, Thromboses et Embolies, Post-opératoires. By Dr. J. DUCUING, Professeur Agrégé, Faculté de Médecine, Toulouse, France. Paris: Masson et Cie. 1929. Pp. 478. Fr.60.

THIS book is a comprehensive review of the whole subject of venous thrombosis and phlebitis, particular stress being laid on post-operative conditions. All types of thrombosis and phlebitis are dealt with from the pathological and clinical sides. There are chapters on the anatomy of the veins most commonly involved, the pathological changes underlying thrombosis, and the experiments performed by the author. Treatment, including prophylactic measures, is fully discussed. Dr. Ducuing has evidently studied his cases from the point of view of thrombosis more minutely than most surgeons, for he gives a much higher percentage incidence of clinically manifest thrombosis than any other author, and, moreover, believes that embolism frequently occurs where even the most meticulous examination can reveal no evidence of thrombosis. Dr. Ducuing sets out in detail the signs and symptoms on which his diagnoses are based, and gives case records to illustrate his points. Of particular interest are his investigations into the flow of blood by means of radiological observation of lipiodol injected into veins; on the basis of these investigations he attributes an important rôle in the production of thrombosis to venous spasm. His statistics are not always convincing. For instance, the total incidence of embolism occurring at various ages is stated, but as it is in no way related to the number of operations performed at these ages, an erroneous impression is given.

The book is not easy to read, for its continuity is much broken up with headings and subheadings, and the sequence of thought is not evenly maintained. The author has, however, summarised an exhaustive survey of the literature on all aspects of the question and has brought to his subject a wide clinical experience, a personal enthusiasm, and an impartial judgment. The presence of an extensive bibliography and a full index deserves record, since this feature is too often lacking in French monographs.

TRIAL OF JOHN DONALD MERRETT.

Edited by WILLIAM ROUGHEAD. Edinburgh and London: W. Hodge and Co. 1929. Pp. 326. 10*s.* 6*d.*

John Donald Merrett, a young man about 19 years old, educated at an English public school and afterwards at Edinburgh University, was tried in Edinburgh in 1927 on the two charges of having murdered his mother and of having uttered forged cheques upon her banking account. Mrs. Merrett had died of a revolver bullet wound received at a time when she was alone in the room with her son. He came out and called to the servant that his mother had shot herself. Mrs. Merrett was taken unconscious to the Royal Infirmary at Edinburgh, where her son explained her conduct as due to "money matters." In these circumstances she was treated as an attempted suicide; she lived for a fortnight, and until a few days before her death her mind was perfectly clear; but, as she was never told what was the matter with her, she was naturally at a loss to understand what had occurred. The bullet entered the right ear and lodged behind the nose. The late Prof. Harvey Littlejohn's post-mortem conclusion was that the position of the wound was consistent with suicide; "there is some difficulty in attributing it to accident, although such a view cannot be wholly excluded." Several months later the suspicion of murder began to gain ground, especially as it became clear that young Merrett had forged his mother's signature on some 29 cheques. Prof. Littlejohn then revised his former opinion in a second report, in which he described the accidental discharge of the pistol or the intentional self-infliction of the wound as equally inconceivable in view of the direction of the bullet, the position of the wound, and the absence of any blackening of the skin. At the trial much attention was given to the questions of the distance at which a pistol-shot would produce blackening, and whether the discoloration would be permanent or would be removed in washing the wound. In addition to firearms experts several medical witnesses dealt with these matters, Prof. Littlejohn and Prof. John Glaister as witnesses for the Crown, and Prof. G. M. Robertson and Sir Bernard Spilsbury on the other side. Merrett was found guilty of the forgery; on the murder charge there was a majority verdict of "not proven."

The case, which forms one of the Notable British Trials series, is edited with great competence and enthusiasm by Mr. William Roughead. As, however, he manages to convey a strong opinion upon the cause of Mrs. Merrett's death, the inclusion in that series of a trial which took place only two years ago seems open to criticism. A man who has been so recently acquitted of murder ought not so soon to be re-tried, either by journalists or historians.

COSMETICS.

Die Behandlung der kosmetischen Hautleiden. Second edition. By Prof. E. KROMAYER. Berlin: George Thieme. 1929. Pp. 124. R.M. 5·50.

THE art of cosmetics, by which is implied the correction of cutaneous stigmata, not serious in themselves but obnoxious to their victims, is almost ignored by the profession in this country. The dermatologist, whose knowledge of the fundamentals of his science would seem to mark him as the natural and legitimate practitioner in this field, is often too busy in the domain of disease to trouble himself with blemishes, and has no desire to run the risk of earning the opprobrious title of beauty specialist. The unfortunate patient is therefore frequently driven to seek the aid of the unqualified quack or the beauty-parlour, and is lucky if he escapes their clutches in a condition in statu quo ante, both physically and as regards the pocket. It is curious how difficult it is to erase a label. In Germany, the names of Max Joseph and Kromayer have been honoured as cosmetic specialists for nearly half a century, and both of them number among their clientèle many English patients, to whom it would never occur that in this country their benefactor would probably have succumbed long since in the slough of professional suspicion and contempt. It is high time that cosmetics should be placed on a reputable footing, and receive official recognition. She is, after all, the younger sister of dermatology, and no Cinderella at that, for success in this field demands at least as much medical knowledge, and even more manual dexterity, than is considered essential in the elder relation. To any beginner we can strongly recommend Kromayer's manual. He is one of the pioneers of actinotherapy, the water-cooled mercury-vapour lamp that is called by his name was invented no less than 22 years ago, and in its own sphere still has no competitors. If that had been his sole contribution to science his name would live, for the instrument can be used, as a brief perusal will show, in many unsuspected ways. Its well-known attributes are not unduly stressed by the author, but we cannot too strongly emphasise that it is superior to X rays in one most important particular—it is difficult, nay almost impossible, to do lasting damage—an issue that is not always remembered when repeated radiotherapy is undertaken.

A description of the uses and indications of the author's ring-knives and burrs (borrowed from dentistry) is followed by a brief but very useful essay on the principles underlying the treatment of dry and greasy skins; this section contains some excellent and easily memorised formulæ. In the next chapter on corns, and that succeeding on boils, the author describes the uses of ignipuncture, a rather neglected procedure in these days of radium, and there follows a detailed treatise on the ætiology and treatment of acne, than which none better could have been written. The treatment of rosacea and its associated nasal hyperæmia by means of compression application of the "blue-filtered" Kromayer light is worthy of study by every dermatologist, and in no other work that is known to us has a rational treatment of "large pores" been attempted. The remaining chapters are devoted to a study of such common stigmata as lichen pilaris, hyperidrosis—with the author's own method of using X rays (a dangerous expedient in unskilled hands for this affection)—seborrhœa, the various alopecias, and hypertrichosis. The methods advocated for the latter vary according to the size and inclination of the individual hairs. For those emerging at right angles to the surface and of coarse texture, the 0·8 mm. ring-knife is recommended. This is rotated evenly round shaft and root-sheath, thus dividing the epidermal connexions, and allowing easy withdrawal from the loosely connected fibres of the subcutaneous tissues. As the author writes: "The method does not seem to have gained many adherents" . . . it is nevertheless of good service in selected cases. Permanent epilation by X rays and some new claims by the younger generation of radiotherapists are critically examined, and rightly condemned. There is no safe X ray method for the permanent cure of hypertrichosis yet designed; and electrolysis is still the best and safest procedure when skilfully conducted. The two sections on this important subject will repay close study. It will be news to most experts that it was Kromayer who designed the now universally employed "insulated" needle.

Equally wise and valuable are the concluding chapters on the eradication of the almost inexhaustible varieties of nævi, vascular and otherwise, by alcohol injections, radium, CO_2 snow, ignipuncture, each according to its size and texture. And yet, including, as it does, a really vast amount of information, this little paper-covered volume consists only of 124 pages.

A general index, and one relating to the author's unique contributions to the subject, conclude an eminently readable and scientific treatise.

COMPARATIVE PATHOLOGY.

Lectures on Plant Pathology and Physiology in Relation to Man. By L. O. KUNKEL, H. C. COWLES, G. H. COONO, E. C. STAKMAN, H. H. WHETZEL, and W. J. V. OSTERHOUT. London and Philadelphia: W. B. Saunders Company, Ltd. 1928. Pp. 207. With 16 figures. 12*s*.

THESE lectures, given under the auspices of the Mayo Foundation, bring out very clearly the specialisation of racial susceptibility and resistance of plants to parasites and the corresponding variations in the aggressive qualities of fungi. Animal pathologists know of the phenomena but they appear much more plainly in plants, where constitution is evidently of paramount importance. It is also interesting to note that students of parasitic fungi are getting much help in classifying their species and varieties from serological methods.

PHYSIOLOGY.

Homoiothermism: the Origin of Warm-blooded Vertebrates. By A. S. PEARSE and F. G. HALL. New York: John Wiley and Sons. 1928. Pp. 119. 10*s*.

THE development of warm-bloodedness is a very interesting chapter in evolutionary physiology. The authors of this book have lost a good opportunity and give us only a superficial and disappointing discussion of the subject, singularly deficient in data. The bibliography, which occupies more than a dozen pages, contains no reference to H. M. Vernon's essay in *Science Progress* for 1898 (vol. vii., p. 378) which the authors would do well to read.

THE LANCET.

LONDON: SATURDAY, MAY 25, 1929.

LESSONS OF THE CLEVELAND DISASTER.

THE terrible catastrophe on Wednesday of last week at the Cleveland Clinic Hospital, Ohio, when a hundred or more persons, including members of the medical and nursing staff, lost their lives, has illustrated the potential danger of storage of X ray films on a large scale. This hospital was founded in 1891 by a group of Cleveland physicians at their own cost in order to investigate more fully the clinical problems with which they were faced. It was therefore natural that the basement should contain a larger collection of X ray films than would be found in a less well-equipped hospital, and there is a further suggestion that an equally well-equipped laboratory added fuel and noxious products to the flames once these had got out of control. Dr. JOHN PHILLIPS, one of the three founders, himself perished in the fire from which his chief, Dr. G. W. CRILE, escaped only with difficulty. No authoritative account of the disaster has yet reached us, but it seems that after an explosion in the basement of the hospital the products of combustion invaded the rest of the building with results reminiscent of a gas attack in warfare. Although the actual origin of the explosion or fire remains to be cleared up, and may, in fact, be difficult accurately to ascertain since none of those present is alive to tell the story, it is assumed by experts here that, however originated, the lethal agency was the partial combustion of celluloid film. Various gaseous poisons have been mentioned, but chemists here will agree with the Washington Chemical Warfare Service in believing that the deadly brown gas evolved was nitrogen dioxide rather than bromine. The latter, however, cannot be ruled out where quantities of silver bromide were present in what became to all intents a reducing furnace, nor is the suggestion of hydrocyanic gas untenable in the same conditions. But apart from these possibilities more than sufficient is unhappily already known of the higher oxides of nitrogen in giving rise to a rapidly fatal pulmonary œdema, which occurs the more readily in that they are actually less irrespirable than the halogen gases.

The danger from the inflammability of celluloid has proved a serious drawback to the employment of this substance ever since it was discovered in 1869 by the Brothers HYATT, of Newark, U.S.A. The fact that it is a product of gelatin, nitrocellulose, and camphor is itself a sufficient indication of danger, but in practice celluloid, while highly inflammable, is non-explosive under any conditions to which it may be subjected in the work of cutting, turning, or moulding, or indeed under any normal conditions. Ever since the London disaster of 1912 in Moor-lane, when nine girls lost their lives in the flames of a fire started by celluloid, and a Departmental Committee was appointed to inquire and report into the precautions necessary in its handling and storage, research has never flagged into the possibility of obtaining a less inflammable material with equally useful properties. Some success has been achieved, although the addition of extraneous material proved futile by diminishing the homogeneity of the product so essential for photographic purposes. For the preparation of plastic splints, a safe form of celluloid has long been in use, the acetate of cellulose with which these splints are covered, in conjunction with plasticisers, rendering the material practically non-inflammable. But while the dangers of the use of celluloid in the photographic and cinematographic industries have been constantly before the public mind and have resulted in strict official regulations, it is a fact that the X ray film has in no single instance proved to be a source of accident in this country. During the last 25 years the most serious hospital fire was that which occurred in 1923 at the Highbury Pensions Hospital, Birmingham, with the loss of two lives. This outbreak caused the management of King Edward's *Hospital Fund to issue a* revised memorandum of precautions against fire, but although many possible sources of danger are mentioned the X ray film is not one of them. Seven years ago a Protection Committee was formed, as the result of coöperative action between the British Institute of Radiology and other interested bodies, in order to diminish the risks of the X ray room, but, at that time and since, these risks have been primarily those of sudden danger to life from high-tension current and of slow biological risk from prolonged exposure of tissues to rays of short wave-length.

The modern X ray room itself contains little or nothing of an inflammable nature. The insulating oil used in the transformers, switches, and circuit-breakers has a flash-point of 170° C., and oil of this safe kind has practically replaced the use of coal gas as a dielectric. There is no accumulation of unexposed celluloid film in the X ray room, for it obviously cannot be left about except in a thickly leaded container. As to the inflammability of the films in common use, it is true that they will burn fiercely when actually set alight, but it requires flame to do so, and a mere glowing cigarette-end will not start the combustion. The filing cabinets where the films are stored are remote from the rooms in which current is generated or used, and where films are stored on a large scale arrangements are made for the fireproofing of the room itself. This at all events is the practice in institutions where the risk has been most carefully envisaged and provided against; should there have been a certain added element of happy chance in the almost universal immunity from accident, no doubt the Cleveland disaster will lead to a screwing up of precautions to the level of the best.

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THE RIGHT POLICY IN LEPROSY.

THE British Empire Leprosy Relief Association states boldly that its object is to rid the Empire of leprosy. That such an end should be regarded as feasible is a measure of the success attending the therapy introduced by Sir LEONARD ROGERS as a result of his leprosy work in Calcutta over a decade ago. In the latest issue of the Association's quarterly journal[1] the Editor discusses this new and confident outlook which has developed during the last ten years. We know well what happened to the leper of old: "without the camp shall his habitation be." In policy this meant: get rid of the leper; segregate him strictly, and keep him close until he dies. In consequence most cases were hidden, and isolation, when it came at all, too often came too late to prevent him spreading his disease. The new injunction—get rid of leprosy—is altogether different. It works out, and successfully, in the provision of clinic centres where expert medical officers may give lepers the modern treatment which, it has been amply demonstrated, will render contagious cases non-contagious, and prevent the early non-contagious case from becoming a danger to the community. Wherever these treatment centres are established, their success is quickly proved and advertised by the large numbers of hitherto hidden lepers who eagerly seek treatment. The treatment has indeed brought in the era when the leper declares himself a leper.

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[1] Leprosy Notes. No. 5. April, 1929. The British Empire Leprosy Relief Association, 24, Cavendish-square, London, W. 1.

This success depends on accurate treatment after accurate diagnosis—and the importance of the latter can be understood when we realise how potential as a focus of infection is the very early case, not yet become contagious, comparatively difficult to recognise, and yet easiest of all to treat successfully. The medical officers staffing these clinics must therefore be specially trained in their work, and the Association has made financial grants to medical men, so that they shall receive this training, notably at the Leprosy Clinic under Dr. Ernest Muir at the Calcutta School of Tropical Medicine. Sir Leonard Rogers records that by 1927 over a hundred medical men, mostly from India, but some from Africa, Greece, and the West Indies, had received instruction in leprosy work in Calcutta and, since that time, a great many more have had this advantage. There is now a second teaching centre at the leprosy clinic at Dichpali in Southern India. Numbers of men trained at these places are already at work in clinics in other parts of India, new centres for the treatment of leprosy and the dissemination of accurate knowledge having thus budded off from the parent institutions. The leper settlements of Trinidad and of British Guiana are clearly centres ready at hand for the training of leprosy workers for the West Indies; and the leper colony at Kuala Lumpur for those for Malaya. Whole-time experts are now at work in Nigeria, the Gold Coast, and Uganda; they have the material for training needed additional workers in those areas, and many lepers are now voluntarily coming forward for treatment in these African colonies. Their demand must be adequately met. And apart from the expert medical officer at the leprosy clinic, the general medical practitioner can render valuable aid by the recognition of early cases and by treating leprosy where there is no special treatment centre. Doubtless, with the multiplication of leprosy clinics in the tropics, he will increase his knowledge and competency in leprosy by attending the work of a clinic in his province.

Dr. Andrew Balfour points out that the bacteriology and morbid anatomy of leprosy are taught to undergraduates in the medical schools in this country, and especially to post-graduates at the schools of tropical medicine. Furthermore, in London, at the Wellcome Museum of Medical Science, there is a fine graphic exposition of the disease, and a leprosy section is being prepared for the new museum of the London School of Hygiene and Tropical Medicine which will thoroughly illustrate every aspect of the leprosy problem. But even at the schools of tropical medicine opportunities for the clinical study of leprosy are rare in England. No use for teaching purpose is made, or can be made, of the lepers—few in number—in the Homes of St. Giles, in Essex. It would be well, therefore, in view of the great importance of this among tropical diseases, that in any hospital in this country devoted to tropical diseases there should be a special ward for the study and treatment of lepers, and for instruction of post-graduates in the clinical aspects of the disease. At present the rare clinical material in this country is wasted, but such a treatment ward might well attract cases which would otherwise go undetected.

DRUNK IN THE ABSTRACT.

The standardisation of drunkenness is an ancient difficulty. A medical witness stated lately at Marylebone police-court that the defendant was drunk and unfit to be in charge of a motor-car. The magistrate, Mr. Hay Halkett, thereupon invited the witness to disregard the defendant's relation to the motor-car. "You have nothing to do with the car," said Mr. Halkett, "all you have to say is to answer whether he was drunk." If a witness let his mind dwell on the motor-car, continued the magistrate, he was apt to slide into the dangerous theory that, because a car was involved, therefore it was an offence for a man half drunk to be in charge of it; the man must be so drunk as to be justifiably arrested in the street for disorderly conduct. Medical witnesses, therefore, must simply ask themselves the usual questions by which drunkenness is tested. Could the accused coördinate his faculties? Could he speak properly? Was there anything he could not do which he could do ordinarily? These remarks were the more significant because the law is inclined to ignore drunkenness unless the accused is also riotous or disorderly or is engaged at the moment in some particular employment. Thus it is an offence to be drunk while acting as a pilot or as the master of a ship, or as a railway employee, or a postal official, or while in charge of cattle, or of a child in a highway or public place, or while in possession of loaded firearms. Earlier enactments make it also an offence to be drunk in charge of a steam engine and of various carriages, and now, under Section 40 of the Criminal Justice Act of 1925, it is an offence to be drunk while in charge on any highway or other public place of any mechanically propelled vehicle.

In spite of the learned magistrate's direction it is, we think, a little hard for a medical witness to concentrate upon the presence or absence of a kind of abstract drunkenness without taking into account the defendant's relation to his environment. A man may be judged drunk by the way he behaves with his car. Another element in the situation is a certain discrepancy between the medical estimate of drunkenness and the police estimate. A man may be drunk, but if his condition is not too provocative—if, in fact, he is not *very* drunk—he may well find his unsteady way homeward without arrest. We seem to be no nearer to a simple universal standard of drunkenness which witnesses can easily apply and magistrates can accept. It would probably be easier for the police-surgeon if his task were merely to say whether or no the motorist had indulged in alcohol to such an extent as to unfit him for driving. This is what the law has enacted for the pilots and crews of aircraft. The Air Navigation Order penalises them if they place themselves under the influence of any narcotic sedative or stimulant drug so as to become unfit for their duties in respect of the aircraft. Perhaps some day the law will enact a similar penalty for the motorist who, without being fully drunk, is under the influence of alcohol. If proof of such influence is easier than proof of drunkenness, the magistrates may welcome such a change in the law. Even under the present system, out of a total 120,629 motoring offences, 926 persons were found "drunk in charge" of a car during the latter half of last year. It is understood that the metropolitan stipendiary magistrates have recently voted in favour of retaining the speed limit partly on the ground that excessive speed, though not necessarily a cause of accidents, is a fact more easily proved than mere dangerous driving. At any moment public opinion may be aroused by the appalling loss of life due to traffic accidents. The latest statistics show that something like 6000 people are killed on our roads in a year. The only redeeming feature of this holocaust is the fact, which the figures seem to support, that injuries to children are diminishing. Is the youngest generation evolving a protective caution or nimbleness in traffic which the older pedestrians cannot acquire ?

Annotations.

"Ne quid nimis."

THE ROYAL SOCIETY CONVERSAZIONE.

A CONVERSAZIONE is, in the terms of the lexicographer, *a soirée given by a learned society*. In the case of the Royal Society it is this and something more—namely, a cross-section for public view of the current of modern scientific thought. The conversazione of May 15th was memorable for the cinematograph demonstration of tissue cultures by Dr. R. G. Canti. The film has been exhibited before, but it gains by repetition. The growth of periosteum, choroid, and nervous tissue of chick embryos is shown by photographs taken at regular intervals and accelerated as much as 900 times. The result ranks among the most ingenious and successful attempts to depict the processes of reproduction and of growth. From a purely technical point of view the film is nearly perfect, and to medical men it gives a sense of contact with the familiar, yet elusive, phenomena of repair and new growth which is awe-inspiring. Fibroblasts are seen to grow, as it were, with deliberation from a tiny point of tissue, and around them there hover, like bees among flowers, an ever-increasing colony of wandering cells. With a higher power of magnification, nuclei are seen to divide into chromosomes, the dividing cell struggles for a few moments, then splits in twain, each cell wandering quite definitely away from its sister. Scarcely for a moment is any cell at rest; the sensation of impermanence is oppressive. This aspect is exaggerated under darkground illumination; the mitochondria within the cell are in even more incessant movement, themselves dividing and threading their way through the cell-substance like silver wires. The wandering cells phagocytose dead and dying tissue, leaping on their components like spiders on flies, and their appetite seems infinite, though their size remains the same. To the uninitiated, malignant tissue appears to behave much in the same way as the normal. If the medical student's education were to include the demonstration of such films as these the dry bones of pathology would spring into new and prolific life.

Tissue culture was conspicuous among the exhibits, since the action of radium on mitosis, the delayed lethal dose of radium, and the nature of microglia may all be studied by this means. The exhibit staged by the Strangeways Research Laboratory (Cambridge) indicated that the effect of low temperatures, and of radium on cell division, are very similar, allowing for the considerable lag in the effect of radium. Clinicians are familiar with this phenomenon in the treatment of myeloid leukæmia. Microglia was shown, from its behaviour in repair, and its power of vital staining, to belong to the reticulo-endothelial system. The Rothamsted study of insecticides was of great interest. Pyrethrum is the foundation of most commercial articles for domestic use. Its active principle, which has been isolated and analysed, is of simple structure, but it varies greatly in its effect on different species of insects. For many kinds of agricultural pests, however, its toxicity is many times as great as nicotine, which is taken as the standard. Efforts are being made to grow pyrethrum on a commercial scale in this country. The same institution showed many tropical plants used for the extraction of poisons for fishing. The powdered wood is thrown into the river, and the dead fish collected. It is of interest to note that, in places so far apart as British Guiana and the South Seas, the active principle of the wood is the same. Dr. H. Ettringham presented a beautiful series of models and sections of the scent-producing organs of insects. These are chiefly found in the male insect, and are used to excite or attract the female Cadder-flies, whose heads are less than one-fiftieth of an inch across, they have the most complex organs, sometimes shaped like miniature shaving-brushes, and covered by caps when not in use. The smell is usually imperceptible to man, and the nature of the organs is surmised from analogy. Dr. R. J. Ludford showed the relation of nerve-fibres to normal and malignant epithelium. In the latter there is a great proliferation of nerves, interpreted as an attempt at repair. The actual penetration of epithelium by nerve-endings is a point of great interest. Miss D. M. Cayley, of the John Innes Horticultural Institution, gave the answer to a problem which in the days of exorbitant prices for rare tulips was much discussed. Uniformly coloured tulips are apt to "break"—that is, to give rise to striped forms. The habit is now assumed to be due to a virus, transmissible by aphis bites, and to bear some analogy to the mosaic disease of tobacco plants. The graphic illustration of a sensory nerve impulse was shown by Mr. Bryan Matthews, now a Fellow of King's College, Cambridge. The potential change is one of 20 microvolts only, and lasts for 2/1000 of a second. Valve amplification is used to demonstrate it, the record being made with an oscillograph of a natural frequency of 6000 per second. Sensory impulses have been much studied by Prof. E. Adrian, whose influence is to be seen in this beautiful piece of work.

Other demonstrations in this remarkable collection included a method of tracing the direction and source of atmospherics in wireless telephony, fossils of considerable evolutionary interest, and a collection of insects, widely separated both geographically and phylogenetically, yet with markedly similar morphological details. The last-named exhibit was very suggestive in its indication that similar environments and functional demands create analogous and even monstrous forms wherever they operate. The general impression left by these demonstrations is that the biological sciences in England are in a healthy state. The application of the newest knowledge and most elaborate techniques to biological problems is flattering to the breadth of the biologist's horizon. Life, when its intricacies are too slow in their manifestations to be synthesised, are speeded up by the cinematograph; when too fast to be analysed, they are slowed down by the oscillograph. By means of radium the metamorphoses of nuclei are inhibited; the most beautiful optical devices and the most refined products of the dye-works are at the service of the histologist. The outcome of all this is a sensation that we have controlled life—to some extent; we have at least compelled it to run at our speed. Perhaps we can now take breath, and find out what it is all about. The Royal Society Conversazione is even more impressive in retrospect than in experience. The reach of man still exceeds his grasp; but his weapons of apprehension are to-day a matter of justifiable pride. The universe is too great and too small, it moves too fast and too slow, its voice is too loud and too small for our five senses; but we are beginning to translate it into their language.

THE AMENITIES OF ZÜRICH.

THE annual congress of the Royal Institute of Public Health was held at Zürich from May 15th to 20th under the presidency of Lord Meston, Chancellor of the University of Aberdeen. The visitors were given ample opportunity to see the sanitary arrangements of the city, of which certain peculiar features created considerable interest. The water-supply is derived from two sources, the lake, and springs in the Sihl and the Firzetal, about 30 kilometres from the city. The daily average consumption by about 220,000 inhabitants is approximately 65,000 cub. met., the maximum 95,000, about 30,000 of which are obtained from the springs. The spring water is not treated; it supplies two of the four zones of distribution. The intake of water from the lake is at a point 375 metres from the shore and 29 metres below the surface; at this spot the lake is 50 metres deep. Pollution of the lake in the vicinity of the intake is avoided by connecting up the drains of neighbouring villages with the city sewers. The effluent from the city sewage works goes into the river which flows away from the lake. The water passes through a roughing filter put down in 1914; this takes out the algæ and reduces the organisms to 40–70 per c.cm. After passage through a slow sand filter (covered to prevent the growth of algæ) the maximum number of organisms in a cubic centimetre is 10. The water over the filter never freezes; in the coldest weather the mean temperature of the lake water is always several degrees above the freezing-point. It is not found necessary either to store or sterilise the water.

For a number of years the covered dustcart used at Zürich has been held up as worthy of wide imitation. Recently this has been improved, reduction having been made in the loading level; the height of the side is now only 148 cm., and thus the time and energy expended during the emptying of the bin into the cart has been considerably lessened. Economy is also effected by requiring the driver to help in the loading of the vehicle. Householders have been gradually persuaded to buy a dustbin of uniform pattern, sold in three sizes containing 22, 35, and 50 litres respectively; a subvention of about 3 francs was paid towards the cost by the city. Saving of time in loading has resulted from the use of the uniform bin, 120 being collected in the same time as 100 bins of irregular sizes. For economical reasons collection is not confined to the morning but takes place throughout the day. Horse transport is used in the older flat part of the city with its narrow streets and motor traction in the hilly outskirts. The refuse is burnt in a Heenan and Froude's destructor erected in duplicate, after separation of any iron materials, the emission of black smoke being diminished by the use of an electric device. The heat evolved is used to raise steam which produces electricity. Household refuse from nine adjacent villages is also consumed by the destructor. The streets of the city were noticeably clean and free from litter. Cremation is making considerable strides in Zürich; since 1925 there have been more cremations than burials. An excellent municipal swimming bath is provided along the lake side. Swimmers in Zürich are thus able to avoid all the disadvantages attached to artificial baths in the absence of adequate change or purification of the water. Altogether full use is made of the city's great natural advantages.

LIVER EXTRACT IN DERMATOLOGY.

THE discovery of an efficient antidote to the occasional toxic manifestations of salvarsan and bismuth is overdue, for evidently sodium thiosulphate is not of much value in the later stages. It is well known that in the large majority of cases the liver is the organ which chiefly suffers, and when the patient succumbs cloudy swelling or so-called acute atrophy are the usual post-mortem findings. Dr. B. Spiethoff[1] of Jena raises the important question of the protective rôle of liver extracts in diseases attributed to hepatic dysfunction, and informs us that his anticipations of their antidotal effect in salvarsan poisoning were not disappointed. In several cases (number unstated) of the severe forms of salvarsan dermatitis with high fever, and the much-dreaded complication of cutaneous abscesses, a rapid and noteworthy improvement seems to have set in within a few hours of administering liver. Spiethoff recommends intramuscular injections of a sterile aqueous extract (5 c.cm. = 5 g. liver) up to three weekly doses of 5-10 c.cm. being given for all acute and subacute cases, and for such as are unable for some reason to assimilate liver preparations by the mouth. He never observed intolerance to intramuscular extracts; thus two women with psoriasis developed urticaria when the extract was given by the mouth, although it was well tolerated by injection. He found the liver treatment useful, furthermore, in preventing or aborting a commencing salvarsan or bismuth dermatitis in children with the idiosyncrasy, and it enabled him to carry on the specific treatment pari passu. Since the number of organisms in cases of *Bacillus coli* bacilluria was scarcely influenced by the injections of liver extract, although there was simultaneous improvement of the general health, Spiethoff deduces tentatively that the action of the liver is antitoxic rather than bactericidal. In experiments on psoriasis during the last two years, he found that as long as liver extract is being given there is a definite inhibition of fresh lesions, although no influence on the established eruption is apparent. He suggests that there may be a hepatic factor or association in the production of psoriasis, for relapses and recrudescences are seen as soon as administration of the extract is discontinued.

CENTENARY OF THOMAS YOUNG.

THIS month sees the centenary of the death of Thomas Young, of whom the late Dr. Howship Dickinson truly said that he was "the most comprehensive genius and greatest man of science who ever held the office of physician to St. George's, or indeed any other hospital." Young was born at Milverton, in Somerset, the eldest of ten children, of Quaker parentage, in the year 1773, and was thus in his fifty-sixth year when he died. As a child he was precocious, being able to read with considerable fluency by the time he was 2 years old. He started the study of Latin at the age of 6, and at 7 was sent to a boarding school near Bristol, and began, as he says himself, to be his own teacher. From 1782–86 he was at a school kept by a Mr. Thompson at Compton in Dorset, where, in addition to the ordinary classical curriculum, he read books on natural philosophy and some of Newton's works, with Martin's optics. He also learnt to draw, to turn on a lathe, and to use a quadrant in measuring altitudes. In 1792 he began the study of medicine at the Hunterian school in Great Windmill-street, and in the following year entered as a pupil at St. Bartholomew's Hospital. In that year, when only 20 years of age, his celebrated paper on the mechanism of the eye was read before the Royal Society, and for this paper he was elected F.R.S. in 1794. In 1802 he was elected Foreign Secretary of the Society, and in 1827 he was chosen one of the eight foreign associates of the Academy of Sciences at Paris, succeeding Volta.

Young had greater advantages than usually fall to the lot of an embryo medical man, for his uncle was the well-known Dr. Brocklesby, who left house, books, and a considerable sum of money to his nephew; but he also had a far more catholic education than most of his contemporaries, for he studied at Edinburgh, Göttingen, and Cambridge Universities, before beginning practice in Welbeck-street. It is not easy to summarise his scientific activities briefly. We may recall his work on the undulatory theory of light and the ingenious experiments on his own eyes which proved the presence of a considerable degree of lenticular astigmatism in his own person; and, of course, his investigation of colour vision. His work for the "Nautical Almanack" and the Board of Longitude, and that in connexion with life assurance, must be mentioned, whilst to the lay mind his research on Egyptian hieroglyphics, which was done independently of, and rather earlier than, that of Champollion, is even more interesting. His "Practical Nosology and Pharmacology," which appeared in 1813, is an extremely learned work which will repay perusal by the curious to-day. The students at St. George's are reputed to have said of Young that he was a great philosopher but a bad physician. He was regarded by his medical contemporaries as a feeble practitioner, but the Apothecary (the "super house physician" of the day) is credited with the observation that a greater proportion of Dr. Young's patients were discharged "cured" than of those subjected to the more heroic treatment of his colleagues. The beautiful copy of his portrait by Sir Thomas Lawrence is one of the chief glories of the board room of St. George's Hospital.

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[1] Münch. Med. Woch., April 5th, p. 577.

Young was buried at Farnborough, in Kent, and a medallion with a tablet to his memory is in Westminster Abbey. From the inscription, which was composed by Hudson Gurney, we may quote the sentence, that he was "a man alike eminent in almost every department of human learning."

CONGENITAL VALVULAR OBSTRUCTION OF THE POSTERIOR URETHRA.

IN the April number of *Surgery, Gynecology, and Obstetrics* Dr. Hugh Young and Dr. Robert McKay, of Johns Hopkins Hospital, write on that comparatively rare condition, congenital valvular obstruction of the prostatic urethra. Although valvular obstruction of this kind was recognised 135 years ago, it received little attention until recently, partly because it was only discovered at autopsy or accidentally during the course of an operation. Probably the first time it was observed through a cystoscope was in 1912, and the first successful operation is said to be that recorded by Young himself in 1913. Since then more notice has been taken of the condition in urological literature. In their present paper Young and McKay have collected reports of 21 cases of congenital valvular obstruction of the posterior urethra seen at the Brady Urological Institute, and besides these have collected from the literature 41 additional cases, of which 12 were treated by operation. The symptoms attributable to valves in the posterior urethra may be grouped under two headings—namely: (1) those brought about by obstruction to urination, and (2) those resulting from so-called back-pressure upon the kidneys, producing renal damage and insufficiency, and finally uræmia. The patient is always a child, and the symptoms of the first category may be difficult to elicit. On careful questioning, however, a history of difficult micturition since birth, with delay in starting the act and a tendency towards dribbling at the end, is usually obtained. Not infrequently there is incontinence both by day and night, this being of the paradoxical type, due to overflow from a distended bladder which is never quite emptied. The symptoms of the second category are those of chronic uræmia and may simulate chronic diffuse nephritis or polycystic kidneys. The diagnosis rests on posterior urethroscopy, cystoscopy, and radiography after distension of the renal pelvis, ureter, and bladder with sodium iodide. A cystogram will always show dilatation of the vesical orifice and a continuation of the opaque medium down the posterior urethra to the site of the valves, producing a typical tunnel-shaped end to the cystogram. Careful urethroscopic examination of the posterior urethra will reveal three types of congenital valves in the neighbourhood of the verumontanum—a double bifurcating valve springing from the distal portion of the verumontanum, a bifurcated valve extending from its proximal portion, or an iris-shaped valve lying above the verumontanum. It may be recalled that a case corresponding to the first type was described not long ago in our own columns.[1] Once the condition has been recognised operative treatment is usually a simple matter, according to Young and McKay, who have had satisfactory results from the use of a small-sized punch of the type associated with Young's name. Unfortunately, in the vast majority of cases, the diagnosis has not been made until extensive damage has occurred to the renal tissue, so that the patient, although temporarily relieved of obstruction, ultimately dies of uræmia. In handling these cases the same precautions must be taken as are required in the treatment of long-standing prostatic obstruction. The distended bladder must be slowly emptied through an in-dwelling catheter, and for this purpose a small ureteral catheter will be found useful. Once the urinary tract has been emptied and equilibrium is established cystoscopy and radiography may be carried out in safety. No operation should be undertaken until renal efficiency tests show that a maximum of recovery has been obtained. As for its nature, nothing more than a per-urethral operation is ever required; it may take the form of punching out the valves or of fulguration through a suitable posterior urethroscope. The prognosis naturally depends on the amount of renal damage done before the obstruction was discovered. The points specially emphasised by Young and McKay are the need for early diagnosis, the importance of methods of decompression, and the good results obtainable from a simple punch operation.

ETHER IN THE TROPICS.

THE medical profession in India has been curiously conservative in its allegiance to chloroform. From time to time articles have appeared in the *Indian Medical Gazette* advocating the use of ether, but they have generally attracted little notice, and the result, so far as any extended change from one anæsthetic to the other is concerned, has been almost nil. Quite recently Major J. B. Hance,[1] I.M.S., and Dr. Joti Pershad have made out a good case for the superiority of ether to chloroform, or chloroform mixtures, for anæsthesia in India. They contend that the position of ether is unchallenged in temperate climates and that the same arguments are equally applicable in India, and they ask very pertinently why an anæsthetic which has the advantage of being a cardiac and respiratory stimulant instead of a depressant, and which has none of the dangers associated with delayed poisoning, is not more popular with surgeons practising in that country. Various explanations have been put forward for this attitude, the chief being that chloroform is safer in warm climates than in cold, and that the rapid evaporation of ether, when administered by the ordinary open method, renders its general employment too expensive. As regards the first of these considerations, deaths on the operation table in most Indian hospitals are not subject to any scrutiny comparable to that of the British coroners' courts, which may have something to do with the idea that chloroform is safer in warm climates; it is, however, true that the vapour is not so likely to hang about in undue density as at a lower temperature. With regard to expense, the cost of pure anæsthetic ether may well have been a serious factor in the past, but the position has been simplified by a recent modification of the excise regulations. The method of administration has an important bearing on the question of expense. In a hot country, if the drug is poured direct on to a mask, there is great wastage, but other means of administration are available. Major Hance recommends Shipway's apparatus, which needs no description here. Another apparatus which is not so familiar, but which has certain advantages of its own, is Pinson's "ether bomb"[2]; this has already been used by several surgeons of repute in India. The apparatus consists essentially of a strong steel-container, with a needle valve to control the supply of vapour, which travels through a small-bore rubber tube, and is delivered under an ordinary open mask, by means of a metal nozzle inserted through the covering of the mask. When in use the container is placed in a large bowl of boiling water, which is renewed from time to time according to the instructions. The apparatus seems particularly suitable for up-country use. It may be recalled that chloroform long held its own in Edinburgh. Even now the simplicity of administration remains a great advantage, and one may still occasionally hear a devout aspiration, from an overworked general practitioner, for a Scotsman with a bottle of chloroform and a piece of lint. But, except in India, considerations of this kind are not allowed to outweigh the superior safety of ether. The latter has been used regularly in the Philippine Islands under tropical conditions, and surgeons in many lands have demonstrated the fact that a warm climate does not contraindicate its use. Any inconvenience which may arise from the employment of special apparatus, or the slight delay in the induction of anæsthesia, is more than compensated by the feeling of confidence.

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[1] A Case of Congenital Valvular Obstruction of the Urethra. By Helena B. King and W. P. H. Sheldon, THE LANCET, 1928, ii., 1120.

[1] Indian Medical Gazette, September, 1928.

[2] See THE LANCET, 1921, i., 336.

THE CONTROL OF MEASLES.

THE old proverb about taking the horse to the water seems to be borne out by the state of affairs which, according to the local press, exists in St. Helens. We learn that the medical officer of health of that county borough at a recent meeting of the public health committee was moved to express his disappointment with the response made to various administrative measures intended to meet the needs of the population during the measles epidemic which presently prevails. These arrangements are what have now come to be regarded as standard practice by public health workers and consist of arrangements for the visitation of patients in their homes by trained nurses, and the setting aside of hospital accommodation for cases requiring it. How far these praiseworthy efforts have justified their provision may be calculated from the fact that in 1927 among 2892 cases of measles, assistance in home nursing was sought in only 59, and of 78 cases admitted to hospital 60 proved fatal. In 1928, of 1336 cases, home nursing was sought on behalf of 14 and hospitalisation for 21. In January and February of this year, although 572 cases have occurred, 10 only have had home nursing, and in two four-weekly periods of the present epidemic 35 deaths have occurred. From this evidence Dr. Frank Hauxwell's complaint seems to be well founded. The reluctance to take advantage of the services provided is ascribed to great apathy of the citizens and lack of support on the part of the general practitioner. Possibly, however, the good offices of the latter, like those of the medical officer himself, are themselves reduced to naught by the inertia of the parents. The negative attitude of the public about measles is nothing new and may be due to the fact that during epidemics, while few escape who are unprotected, the great mass of those attacked, and especially older children, come off comparatively lightly, so that the majority of parents are not impressed with the danger. In the past the serious results of scarlet fever and diphtheria were well established in the popular memory and the dread of these diseases is still a factor to be reckoned with. Now that their mortality has fallen, measles is left prominent among the causes of death in childhood, but this fact has not apparently got home to the community at large. The only way in which the public can be brought to realise the dangerous nature of measles is by propaganda, and of all the forms that can be directed on this particular problem there is little doubt that the tactful influence of the nurse in home visiting is the most effective. We think that Dr. Hauxwell is right in giving this measure a prominent place in his anti-measles campaign, but like other forms of propaganda, it must find its own way to the persons whom it is necessary to stimulate. We do not know what has been the custom of St. Helens, but many authorities have found it advantageous not to wait for applications from parents, but to seek out cases which have come to their knowledge through absence from school, infant welfare centres, and other places. Visits to affected homes often supply information about cases in other houses, and experience has shown that the district nurse, to whose ministrations the people are accustomed in other types of illness, is well suited for this class of work. Furthermore, these nurses are already in daily contact with practitioners in respect of ordinary routine cases, their visits are seldom regarded as intrusions, and often they will urge the calling in of a medical man at a stage in the illness when he can usefully intervene. It should be realised that during measles epidemics the resources of a health department may be greatly taxed and energies may have to be diverted temporarily from other less urgent activities and concentrated on the problems of the moment. There is another way of attacking an epidemic of measles which has been proved effective but is not sufficiently exploited in this country—the prophylactic injection of serum from convalescents. Clinics and laboratories for the collection, preparation, and distribution of measles serum have been established for several years now in Paris, Berlin, Munich, New York, Vienna, and many other towns, and the reports from each centre are favourable. In Paris alone during the last four years nearly 4000 children have been injected with convalescent serum with marked success, and the organisation is rapidly progressing. In London the Metropolitan Asylums Board prepares just enough serum for its own use. The collaboration of Dr. Richard Massingham, medical officer in charge of the London Fever Hospital, has enabled the Hospital for Sick Children, Great Ormond-street, to obtain serum for use in threatened epidemics. In an emergency the Middlesex Hospital has been supplied from this source, and also a few private practitioners. But in the provinces, as far as we know, there has been no attempt to bottle convalescent serum for use outside the institution in which the patients are being treated. It is to be hoped that the article by Dr. Nabarro and Dr. Signy, published on p. 1106, will arouse interest in this method of prophylaxis, and that practitioners will demand at least such facilities as are available in other countries for the supply of serum. Although there is no striking national epidemic, many deaths are occurring weekly from measles. Experience has proved that many of these deaths could be avoided if good use were made of the proved willingness on the part of adult convalescents in fever hospitals throughout the country to act as donors. It may be that in the future a more convenient source of serum will be found, but at present, according to Gunn, the animal serums supplied have not proved effective, and human serum remains the only certain method of controlling the disease.

THE INITIAL LESION OF SLEEPING SICKNESS.

ON Sept. 16th a European on a plantation in Cameroon noted a smarting pimple on his face; next day he had fever and slight shivering, and that night he was greatly worse. On the 18th Dr. Graf, at Buea, was told that the patient had a boil, and as it sounded not unlike malignant pustule, he went to see for himself. He found [1] a round inflamed area, about an inch across, on the left side of the face just below the ear; there was a red spot in the centre, around that a pale ring, looking like blisters run together, and outside this another red ring. The neighbouring tissue was swollen, and the central "boil" was hard and painful; the temperature was 102° F., and the pulse-rate 100. A bystander said the boil reminded him of a tsetse sting another friend on the same plantation had had two years before. A drop of blood was taken from the inner edge of the white ring, and in the stained film many trypanosomes were seen. Next day the patient was taken to Victoria to have the diagnosis confirmed. On Sept. 20th, which was the fourth day of the illness, trypanosomes were found in the finger blood. Germanin 1·0 g. was given intravenously on the 20th, 22nd, and 24th. Parasites were not seen on the 23rd or later, and after that day there was only a trace of albumin in the urine and the boil healed. In his report Dr. Graf said that he was keeping the patient under observation and would repeat the course of germanin in two or three weeks, and test the blood by inoculation if no trypanosomes were seen. He thought that a cure might already have been effected.

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[1] Arch. f. Schiffs- u. Tropen-Hygiene, April, 1929, p. 219.

One case leads to another. A second patient from the same plantation, having heard of the earlier case, came to Dr. Graf on Sept. 23rd. He believed that he had been bitten on the right temple by a tsetse-fly eight days before; he had at least seen the fly make its escape. The development of the lesion had been similar but less acute; it had decreased after the third day, and had disappeared by the fifth. Always well before, the patient had since suffered from headaches and had lost his appetite. Trypanosomes were found on immediate examination of blood from the finger, and he had his first injection about Sept. 20th. The temperature went up and no trypanosomes could be discovered, though there were parasites of subtertian malaria. The patient took germanin and quinine at the same time without inconvenience.

THE ACTION OF THALLIUM

Buschke has done more than any one else to establish the therapeutic value of thallium, and his views deserve careful study. A recent paper,[1] in which he collaborates, classifies the effects of the drug into specific and non-specific. Those noted in the chronic poisoning of animals—especially young rats which appear to be more susceptible than rabbits or guinea-pigs—are as follows: (1) alopecia, specifically limited to the hairs enervated by the sympathetic; (2) disturbances of bony growth, resembling those of rickets and osteomalacia, together with a tendency to cataract and iritis; (3) cessation of the normal sexual periods, which can be restored by administration of ovarian and pituitary extracts; and (4) eosinophilia, hypochlorhydria, alkalosis, and convulsions. (5) Gastric tumours somewhat resembling those produced by Fibiger but not of the same malignancy, may also be observed, and lastly (6) there is an antihidrotic action, on which the whole fabric of thallium therapy was originally based, almost certainly depending on an endocrine-sympathetic action. As applied to man, however, the chronic effects of thallium acetate do not concern us. The drug is administered for the epilation treatment of tinea tonsurans in a single dose of an average strength of 8 mg. per kg. body-weight, and, according to most observers, must on no account be repeated within a period of at least three months. Young children tolerate it much better than those who have passed the age of puberty, a fact which is held to support the theory that it acts partly on or through the endocrines. The specific effects of thallium are shared in lesser degree by other metals in the same "heavy" series. Thus lead may produce slight epilation and an inhibition of breeding proclivities, whilst gold and arsenic, and incidentally salvarsan, are sympathetico-tropic in their toxic effects. The pains in the knee so often observed in children treated with thallium may be traceable either to some intramedullary influence on the bones, or to a mild peripheral neuritis. The non-specific effects of thallium are the same as those encountered in the toxicology of all the heavy metals. They include damage to the axis-cylinders of nerves and to the central nervous system itself, optic atrophy, various cutaneous eruptions, and above all, damage to the renal epithelium. For this last, especially, a careful watch should always be kept, although a slight degree of albuminuria is common and need cause no alarm.

LORD ROSEBERY.

THE death of the Earl of Rosebery on Tuesday last, shortly after his eighty-second birthday, recalls the sympathetic comprehension with which he regarded the medical profession at a time when its public reputation was in some measure in jeopardy. On the eve of the coming into force of the National Insurance Act of 1912 Lord Rosebery, as Chancellor of the University of London, addressed the students of the London Hospital on what he described as the noblest secular profession in the world. He set out in eloquent words the many directions in which medicine was necessarily a forlorn hope; first, in that it never despaired and was always seeking new inspiration and new strength for the battle which could only have one termination, and again because disease when surmounted and conquered was sure to spring up in some new form. He went on to speak of a life spent in the complete conquest of obstacles as a rare one in any profession, and his words can hardly have failed to inspire courage and determination in the hearts of a number of his hearers who were just entering upon the profession of medicine at one of its most critical periods.

THE Interstate Post-graduate Assembly of North America will meet in London next week, when a series of lectures will be delivered at the House of the Royal Society of Medicine. The first session will be opened at 10.15 A.M. on May 27th by Sir John Bland-Sutton, after which short discourses will be delivered by Dr. James Collier, Mr. Victor Bonney, and Dr. Henry Semon. On the next day Sir John Broadbent will preside; Mr. J. E. H. Roberts and Sir William Willcox will give addresses; and Dr. R. G. Canti will give a cinematograph demonstration of tissue cells growing in vitro. On May 29th Sir W. Arbuthnot Lane, Dr. Donald Hunter, and Mr. Donald Armour will speak. In the afternoon special programmes have been arranged at ten general and special hospitals. At 8.30 P.M. on May 28th and 29th receptions will be held respectively at the Wellcome Historical Medical Museum and at the Royal Society of Medicine.

THE St. Cyres Lecture of the National Hospital for Diseases of the Heart will this year be given at the hospital at 5 P.M. on Thursday, June 6th, by Dr. R. O. Moon. His title will be Some Observations on Diseases of the Myocardium.

TWO large anonymous gifts to hospitals, intended as thankofferings for the King's recovery, have been announced within the past few days. Money to the amount of £10,000, together with freehold properties worth about £48,000, have been given to endow the proposed new hospital at Southend-on-Sea, whilst the Royal Portsmouth Hospital has been offered a pound for every pound raised by the end of the year, up to £40,000. The income from the properties made over to the Southend Hospital will not become available for ten years unless the donor should die within this period.

ALEXANDRA DAY.—Wednesday, June 12th, has been fixed as the date of Alexandra Day. Since 1912, when it was begun, about £1,500,000 has been collected.

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[1] Buschke, A., Loewenstein, L., and Joel, W.: Med. Klin., March 22 d, p. 462.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCXCIII.—THE PROPHYLACTIC TREATMENT OF MEASLES.

IT is opportune, in the face of the recent rather severe epidemic of measles in some Midland cities, to bring up anew the subject of prophylaxis of this disease. In this outbreak there have been many hundreds of cases reported with a considerable number of deaths. In our opinion these numbers could have been very greatly reduced had the use of convalescent measles serum been more generally adopted and contacts more vigorously treated. Moreover, the family doctor is often faced with the demand for advice as to how to protect a younger or more delicate child from infection when measles has been diagnosed in one member of the family who is being nursed at home. Isolation is sometimes impracticable under modern housing conditions and, in any case, the infection may have been passed on before the sick child was separated from its brothers. There might at present be some difficulty in obtaining convalescent serum for a case seen in private, since young children cannot safely be used as donors, but if the demand became insistent doubtless adult volunteers could be secured by arrangement with the medical officer in charge of local fever hospitals. Even where this is not possible, the alternative method, described below, of giving whole blood could be used, and for this purpose sufficient blood could be taken from all but very young children.

Our experience has been chiefly with institutional cases, and it is from this point of view that the following notes have been compiled. When for any reason there is particular anxiety to avoid the infection of a particular child, the practitioner should find it possible to procure the material necessary to ensure prophylaxis or at least a very mild attack.

Convalescent measles serum was used in prophylaxis and treatment of measles many years ago on the Continent, but fell into general disfavour owing to faulty technique in its preparation. Cases are reported of death following grossly contaminated sera and also of a tuberculous lesion of the skin at the site of inoculation. In recent years many attempts have been made by various workers to isolate a streptococcus from cases of measles and to produce on a large scale an antitoxic serum. R. Tunnicliff, N. S. Ferry and L. W. Fisher, and R. Degkwitz, amongst others, have all produced sera which have had extensive clinical trials and have, so far, all been found to be inferior to convalescent measles serum in their power to prevent or modify an attack of measles. Gunn, working at the Metropolitan Asylums Board (THE LANCET, 1928, ii., 691), compared the three sera mentioned with convalescent serum and found that whereas Tunnicliff's serum protected 43 per cent. of contacts, Ferry and Fisher's serum protected none, Degkwitz's protected 40 per cent., and convalescent measles serum protected 95·7 per cent. These figures show a marked superiority in the protective powers of the convalescent serum, and this is supported by the fact that the non-protected cases were markedly attentuated.

Preparation of Serum.

This presents one or two difficulties, the most important being that the majority of cases of measles occur in children, and it is difficult, and often inadvisable, to take much blood during their convalescence. We have been particularly fortunate in the collaboration of Dr. R. Massingham, superintendent of the London Fever Hospital, who has collected a large amount of blood for our combined uses from the numbers of adult measles cases which are admitted to his hospital. Many adult volunteers gave 200–300 c.cm. of blood, and suffered no ill-effects. Care is taken to ascertain that there is no tuberculous or syphilitic taint in the family history, that the case was not a complicated one, and that the patient is not incubating another disease. The blood is taken on the seventh–tenth day after defervescence, collected aseptically into sterile tubes, and allowed to clot. The serum is pipetted off when separated, and the remaining clot loosened and centrifuged. By this means we have been able to obtain as serum at least 50 per cent. of the blood collected. Each batch is tested for sterility, the Wassermann test is done, and 0·5 per cent. phenol is added. If these tests are satisfactory, the batch is pooled with several others to make a serum of fairly uniform potency. Before final bottling, the serum is filtered and another sterility test is done. Some workers advocate heating the serum on two successive days at 56° C. for one hour. Prof. R. Kraus, of Vienna, inoculates a sample of each batch of serum into a guinea-pig to make certain of the absence of tuberculous infection. In no case hitherto has tuberculosis developed in the guinea-pigs, and this should be sufficient proof of safety.

Indications for Use.

1. *The protection of young children* in whom an attack of measles might have a fatal or very severe effect. This applies particularly to sick children, such as those who have recently been operated upon and then been exposed to infection, or those suffering from other acute diseases.

2. *The prevention of the spread of infection.* All contacts in hospitals and institutions should be inoculated within six days of exposure. This protects the contact in about 90 per cent. of all cases and efficiently prevents the spread of the disease. It also saves a great deal of expense and worry to those responsible for the institutions, and is particularly useful in fever hospitals to prevent cross infection from spreading.

3. *The attenuation of an attack.* This is achieved by injecting the serum from the sixth to the ninth day after exposure. In most cases so treated the incubation period is prolonged and the attack is greatly modified, there being a greater interval between the initial coryza and the appearance of the rash (six days in one case) and the absence of Koplik's spots. This method has a great advantage when used apart from institutions, because it confers a permanent active immunity against the disease, whereas inoculation in the early incubation period gives a passive immunity lasting approximately three weeks.

4. *In the diagnosis of measles.* If the serum is injected on the tenth day, the course of the disease will be unaffected, but the so-called Debré phenomenon will be observed—an area of blanching of the measles rash around the site of an intradermic injection of the convalescent serum. The potency of the serum can be gauged by the Debré phenomenon. Intradermic injection of serum into a well-developed measles rash has not produced blanching in any of the cases in which we have tried it—cf., the Schultz-Charlton reaction in scarlet fever.

Convalescent serum has been used therapeutically in the treatment of severe cases of measles, but although large doses of the serum have been injected, no improvement that could be attributed to the serum has been noted.

Dosage.

Sutherland and Anderson, when attacking an outbreak at the Monsall Hospital, Manchester, used 10 c.cm. given subcutaneously, irrespective of age, condition, or length of exposure. This is a very large dose, but it is advocated when it is essential to wipe out a local epidemic. Debré, at the Paris Clinic, uses 3 c.cm. for children under 1 year, and this is increased by 0·5 c.cm. for every additional six months.

We have used 3 c.cm. for children up to 3 years of age and 5 c.cm. for children over 3. These amounts, however, were not strictly adhered to, an extra c.cm. being added if the children were well-developed for their ages. All our injections were made intramuscularly, and in no case was any untoward effect of the serum noted, there being no serum sickness or rash.

Gunn's dosage was much like our own, but he prefers to give the injections intramuscularly on the second or third day of incubation. He finds a greater percentage protected than with first day injections.

Injections of Whole Blood.

W. S. C. Copeman, who has recently written a good résumé of this subject (Proceedings of the Royal Society of Medicine, May, 1927), states that in cases of emergency citrated whole blood may be used in place of serum. Such a procedure might be of value where one child in a family was convalescing from measles, and it was thought desirable by the practitioner to protect one or more of the patient's brothers and sisters. As the blood would be injected subcutaneously or intramuscularly, there would be no need to do a blood-grouping, but the dose of blood injected would have to be about double the amount of serum which would have been given. One c.cm. of 10 per cent. solution of sodium citrate taken up into a 10 c.cm. syringe would prevent the coagulation of that amount (10 c.cm.) of blood.

Results.

Debré reports 80 per cent. complete protection over a very large number of treated children. Gunn reports 95·7 per cent. of complete protection. Of the five cases which developed measles three had been injected on the first day and two on the eighth day. Those injected on the first day could hardly be diagnosed as measles. The control cases of Gunn and of Sutherland and Anderson show a very high percentage of infection.

In our own series 55 children housed in wards which had had cases of measles were injected usually on the second day of exposure. Some of these cases, however, were children who were newly admitted into a measles-infected ward without any further precaution. This procedure was justified inasmuch as none of the children developed measles. The ages of the children varied from six months to twelve years. Fifty-one cases were completely protected—i.e., 92·7 per cent. Of the remaining four, one developed an apparently normal attack 16 days after the injection, two others had very mild attacks (19 and 21 days), and one had a doubtful attack (21 days). In view of the epidemic, however, it was thought advisable to send these mild cases to the fever hospital. Certain wards, where the use of serum was not allowed, served as controls, although not scientifically exact ones. The incidence of infection in these wards became high and eventually they had to be closed completely, or open only to children who had definitely had measles previously, and whose parents were willing to risk the infection.

Conclusion.

We agree with Gunn that until an animal serum more efficacious than those at present available is put upon the market, human convalescent serum is the only certain method of controlling measles. Even if it were possible by this means to stamp out the disease, it is doubtful if, on epidemiological grounds, such a policy would be a wise one. It should be our aim, however, to protect *every* child under 3 years of age, as well as older children who are in feeble health, from contracting measles. The method is already being applied to a limited extent in institutions in this country, but it should be used in suitable cases in private practice, either for prevention—i.e., production of passive immunity—or preferably and where possible for attenuation—i.e., production of active immunity. As has been pointed out, no ill-effects are noted where the serum has been carefully prepared, and as the serum is of human origin there is no fear of anaphylaxis following upon its injection.

D. N. NABARRO, M.D., F.R.C.P. Lond.,
Director of the Pathological Department, The Hospital for Sick Children, Great Ormond-street.

A. SIGNY, M.R.C.S. Eng.,
Assistant Pathologist to the Hospital.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdr. P. F. Woodruff-Minett is placed on the Retd. List with rank of Surg. Capt.

C. J. Farr to be Surg. Lt.

The following appointments are notified: Surg. Lts. J. W. Simpson to *Excellent;* R. C. Webster to *Dolphin*, temp.; and H. J. McCann to *Mackay* (on recommg).

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Lt. J. D. Simpson to be Surg. Lt.

Proby. Surg. Sub-Lieut. D. MacK. Craig to be Surg. Sub-Lieut.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. W. J. S. Harvey, having attained the age for compulsory retirement, is placed on retd. pay.

Lt.-Col. F. J. Garland retires on retd. pay.

Maj. G. S. McConkey relinquishes the appt. of Dep. Surg., R. Hosp., Chelsea.

Maj. F. M. Lipscomb to be Dep. Surg., R. Hosp., Chelsea.

The undermentioned Majs. to be Lt.-Cols.: C. E. W. S. Fawcett and A. M. Rose.

Lt. (on prob.) W. F. L. Hannay, from the secd. list, is restd. to the estabt.

TERRITORIAL FORCE.

Capt. H. C. Sands to be Maj.

Capt. A. C. Ballance resigns his commn.

Lt. A. Roberts (late R.A.M.C., Supp. Res. of Off.) to be Lt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Lt. F. R. Daniel, from Active List, to be Lt.

ROYAL AIR FORCE.

Flying Officer R. E. Alderson ceases to be seconded to the Royal Victoria Infirmary, Newcastle-upon-Tyne.

Surg. Lt.-Comdr. T. N. D'Arcy, having obtained the highest aggregate marks at the examination held in 1929 for promotion to the rank of Surgeon Commander, has been awarded the Sir Gilbert Blane gold medal.

ENLARGEMENT OF CHELMSFORD HOSPITAL.—It is intended to enlarge the Chelmsford and Essex Hospital by the addition of men's and children's wards, out-patient, and casualty and other accommodation.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.—Lieut.-Colonel G. S. Parkinson, D.S.O., R.A.M.C. (ret.), has been appointed part-time assistant director of hygiene at this school.

During the late war Colonel Parkinson was Deputy Assistant Director of Hygiene with the First Army, and later Assistant Director of Medical Services. After the armistice he served for five years D.A.D.H. at Gibraltar, where he undertook the duties of Medical Officer of Health for the civilian population and the administration of a complete health department responsible for sanitation, school medical work, tuberculosis, venereal diseases, maternity and child welfare, and poor-law medical service. On his return from Gibraltar, he was appointed Assistant Professor of Hygiene at the Royal Army Medical College, Millbank, and held the senior post for several months during the absence of the Professor on leave. After his retirement in July, 1927, Colonel Parkinson held several temporary posts in the public health service before becoming assistant to the Executive Secretary of the Society of Medical Officers of Health. For the past six years he has been hon. secretary of the Naval Military and Air Force Hygiene Group of this Society.

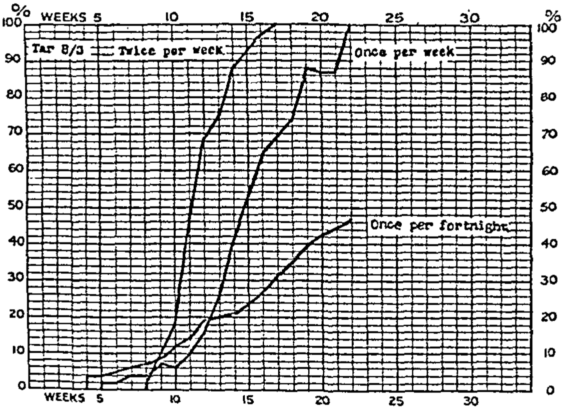
Special Articles.

SOME FACTORS INFLUENCING THE DEVELOPMENT OF EXPERIMENTAL OIL AND TAR TUMOURS IN MICE.

BY C. C. TWORT, M.D. ABERD.,
AND
J. M. TWORT, B.SC. LOND.,
PATHOLOGIST AND ZOOLOGIST TO THE MANCHESTER COMMITTEE ON CANCER.

ALMOST all our early experiments with carcinogenic agents consisted in the application of the tar or oil to the backs of 100 mice twice weekly. This procedure constituted our standard experiment. For several reasons we imagined that when using a strong agent, such as a synthetic tar, the intervals between the paintings was not long enough to enable the epithelium to give a maximum response, while with a weak agent, such as an American petroleum oil, the interval between the paintings was probably too long. In the former case it is possible that the epithelium is so damaged that it is unable to perform the healthy functions of an active tissue, while in the latter case a certain degree of tolerance or immunity to the agent applied may supervene, with the result that tumour development is delayed. There seem to be four chief aspects of the problem of tolerance and immunity. A tolerance may be developed simply from a thickening of the epithelium, or there may be an acquired local or general immunity of the cells of the host to the agent applied. The tolerance or immunity may be developed to the specific carcinogenic substances or to the tissue-destructive substances so frequently associated with oils and tars. It does not appear that in either oils or tars the carcinogenic substances and tissue-destructive substances are necessarily identical.

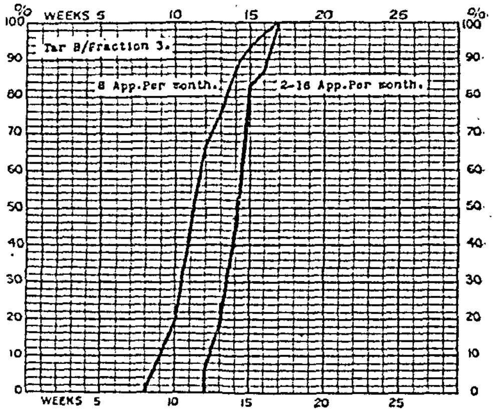
FIG. 1.



Stages in Development of the Method Employed.

These considerations led us to deviate in both directions from the frequency of application in our standard experiment. Our synthetic tars were applied to the skins of animals only once a week or once a fortnight, while mineral oils were applied daily, five times a week. Two experiments with a pinene synthetic tar have been discussed previously,[1] so that here it will be sufficient to give a graph of the final results (Graph I.).* The feature of interest in these experiments is the early development of the first tumour in the skins which were allowed long intervals of rest from contact with the carcinogenic agent, and the subsequent falling-off in the number of tumours developing as the skins acquired a tolerance for the agent. The control animals of the standard experiment were unable to react to the too powerful agent until a tolerance had developed, when the tar was what may be considered 100 per cent. active, or—what comes to the same thing—when the skins were 100 per cent. responsive to this particular agent.

FIG. 2.



From these results it seemed obvious that to obtain the steepest graph with a very powerful agent it would be necessary to commence the experiment with applications at long intervals and gradually to increase the frequency of the applications to keep pace with the skin tolerance developed.

We conducted an experiment wherein the 44 applications of an experiment lasting 22 weeks were not equally distributed over the whole course of the experiment. Two applications were given during the first month, 4 during the second month, 12 during the next six weeks, 18 during the following six weeks, and 8 during the last two weeks. In Graph II. will be found the results of painting the animals 2–16 times per month compared with those of the standard experiment, wherein the animals were painted 8 times per month.

The experiment was very unsatisfactory owing to a poor batch of animals. For this reason there were no early tumours—i.e., the occasional very susceptible animal usually found among each batch was absent. The general development of tumours was later than that among the controls until the seventeenth week, when in both experiments all animals remaining alive were bearing tumours. At this stage of the experiment the controls had received 34 applications, while the batch painted 2–16 times per month had only received 27 applications. In this respect the experimental results were in conformity with our anticipations, but we are not satisfied that they are reliable, and the experiment is being repeated.

Our first oil experiment consisted in the daily application of shale oil to the backs of 100 mice five times per week. The refined sample of shale oil used had a moderate degree of carcinogenic activity, being somewhat less powerful than the average gas tar but very much more active than any American petroleum oil we have tested. The results of this experiment were in accordance with our expectations. The first tumour appeared during the ninth week after the commencement of the experiment, and at the twenty-third week the few animals remaining alive all bore tumours. The first tumour appeared among the animals of the control standard experiment also in the ninth week, but at the twenty-third week only 41 per cent. of the animals living bore tumours. Malignancy supervened six weeks earlier in the animals painted five times per week than in the controls, and Graph III. shows that the general development of tumours among the more frequently painted animals reached a high level much more quickly than among the controls.

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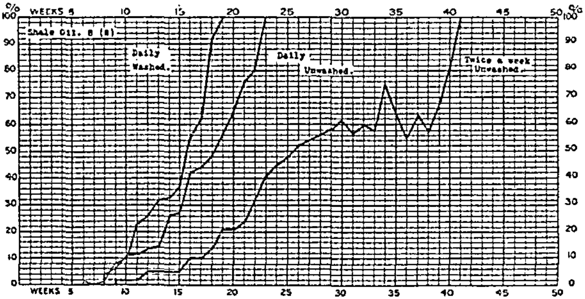
[1] Jour. Hyg., 1928, xxviii., 219.

* The graphs are compiled from the percentage of living animals which bore or had borne tumours at the end of each week since the commencement of the experiment. As 100 animals were used for each experiment and the duration of the experiments was not long, in order to make the graphs clearer the death-rates have not been included.

The effect of the frequent application of the American petroleum oils was then tested, and it was found that tumours developed earlier than when the oils were applied only twice a week.

Oil No. 3, a highly refined Pennsylvanian oil, applied twice a week to two groups of 100 animals, gave rise to the first tumour in the thirty-fifth and the thirty-eighth week respectively, while among the animals painted five times a week the first tumour appeared as early as the eighth week, and it had become malignant by the twelfth week. Malignancy did not occur among the control animals until the fifty-ninth week. Similarly, oil No. 9, a refined Californian oil, which in two standard experiments induced a tumour in the nineteenth and the fourteenth week, when applied five times a week induced a tumour in the remarkably short time of two weeks. By the tenth week 10 per cent. of the animals remaining alive bore tumours, while among the control animals painted twice a week no tumours had arisen at this stage.

FIG. 3.



Three further samples of refined lubricating oils are being applied to animals frequently, but it is too early to draw definite conclusions from the experiments, although the hyperplastic response of the epithelium can already be seen to be excessive as compared with that found in the standard experiments. Meanwhile we have been unsuccessful in inducing tumour formation by the daily application of two oils, No. 4, a liquid paraffin, and No. 12, a sperm oil, which had given us negative results in our standard experiments over 85 and 70 weeks respectively.

When we began our investigations on the carcinogenicity of lubricating oils we endeavoured to obtain a reliable method of concentrating the active principle to enable us to make a more rapid diagnosis of a particular sample than was possible when using the whole oil. It appears from our results with the daily applications that we have here a reliable and even quicker method than that of the bi-weekly application of the concentrated oils. Whether daily application of the latter will still further shorten the period necessary for diagnosis is doubtful, although we are proceeding to test this possibility.

The Protection Offered by Animal Fats.

It has been shown that, if the superfluous tar which may remain on the back of the animal from a previous painting is removed by petroleum ether before the next application, tumours develop more rapidly than in control animals where the tar is not removed. It was imagined that these results were due to the removal of the hard cake of tar, thereby permitting an easier penetration of the active substances which were contained in the fresh tar. A more likely explanation seems that the petroleum ether removed the natural skin fats so that the tar could penetrate more easily than when applied to untreated skin.

We have found that tumour development is very much delayed if, during the intervals of painting of animals with a potent carcinogenic agent, an emollient oil, such as anhydrous lanolin, is smeared over the skin to soften it and to protect it from the air.

In our first lanolin experiment 100 mice were painted twice a week with a very potent synthetic tar, and on two days between each application lanolin was smeared over the painted area. It was at once noticed that the hair was much less inclined to fall than among the control animals painted only with tar, but nevertheless the few first tumours appeared very early, possibly for the same reason as that given when discussing the early tumours in animals painted with tar at infrequent intervals. Subsequently tumour development among the lanolin-treated animals fell behind that of the control animals, while the tendency for malignancy to supervene was remarkably low.

Graph IV. gives a good idea of the protective action of lanolin; during the middle of the experiment, when conditions may be considered relatively stable, the lanolin delayed the advent of tumours by about 3–4 weeks.

A further confirmatory experiment consisted in the utilisation of shale oil instead of the synthetic tar, when the protection offered by the lanolin was even more clearly shown. The experiment has been in progress for 30 weeks without the advent of a single tumour, while among the control animals untreated with the lanolin at this stage of the experiment 61 per cent. of the animals remaining alive were bearing tumours and 21 per cent. malignant tumours. Not even one or two very early tumours developed in the treated animals, which fact accords with our experience that the shale oil is only a moderately powerful agent. As by this procedure we were unable to demonstrate any carcinogenic activity of the shale oil we performed a more severe test on the protective action of the lanolin. Animals are being painted daily with the shale oil and later in the day a small amount of lanolin is being smeared over the painted area. Also we are investigating the effect of adding a small percentage of lanolin to the shale oil and subsequently applying the mixture daily. It has to be remembered that animal fats are sometimes utilised for the blending of mineral lubricating oils, which may be an important factor in the number of tumours arising in certain groups of spinners. Also, if it is true that wool-spinners do not suffer from epithelioma to the same extent as cotton-spinners, the explanation may lie in the fact that a small quantity of animal fat is intermixed with the oil in the wool-spinning rooms, while no animal or vegetable oil contaminates the mineral oils in the cotton-spinning rooms. Incidentally, our results with the lanolin and our results from washing experiments, about to be described, lend support to the thesis that ichthyotic and xerodermatous skins are more liable to be the seat of epitheliomata than are normal skins.[2]

Removal of the Natural Fats.

The protection offered to carcinogenic agents by the application of a small quantity of an animal fat led us to conduct experiments in the opposite direction—i.e., to remove the natural fat of the skin when in contact with and before the application of the carcinogenic agent.

The first experiment consisted in daily application of

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[2] Savatard, L.: Proc. Roy. Soc. Med., May 19th, 1927, p. 1589

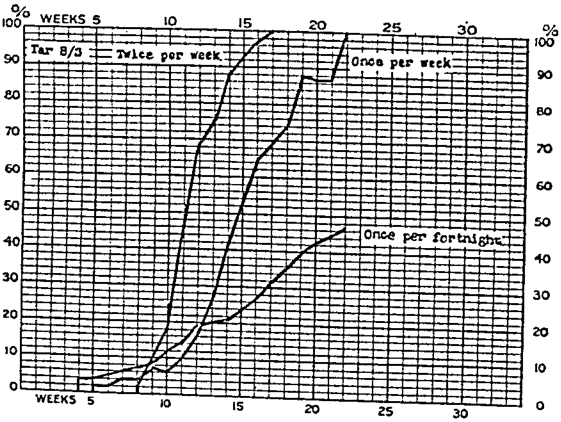
Special Articles.

SOME FACTORS INFLUENCING THE DEVELOPMENT OF EXPERIMENTAL OIL AND TAR TUMOURS IN MICE.

BY C. C. TWORT, M.D. ABERD.,
AND
J. M. TWORT, B.SC. LOND.,
PATHOLOGIST AND ZOOLOGIST TO THE MANCHESTER COMMITTEE ON CANCER.

ALMOST all our early experiments with carcinogenic agents consisted in the application of the tar or oil to the backs of 100 mice twice weekly. This procedure constituted our standard experiment. For several reasons we imagined that when using a strong agent, such as a synthetic tar, the intervals between the paintings was not long enough to enable the epithelium to give a maximum response, while with a weak agent, such as an American petroleum oil, the interval between the paintings was probably too long. In the former case it is possible that the epithelium is so damaged that it is unable to perform the healthy functions of an active tissue, while in the latter case a certain degree of tolerance or immunity to the agent applied may supervene, with the result that tumour development is delayed. There seem to be four chief aspects of the problem of tolerance and immunity. A tolerance may be developed simply from a thickening of the epithelium, or there may be an acquired local or general immunity of the cells of the host to the agent applied. The tolerance or immunity may be developed to the specific carcinogenic substances or to the tissue-destructive substances so frequently associated with oils and tars. It does not appear that in either oils or tars the carcinogenic substances and tissue-destructive substances are necessarily identical.

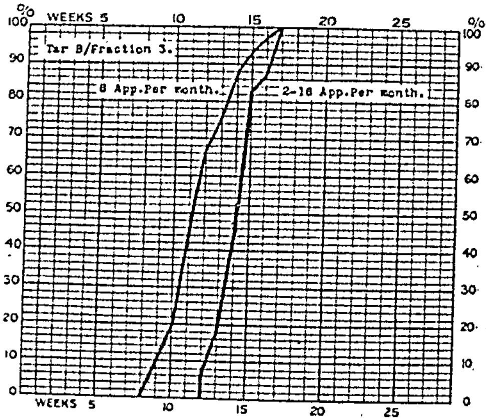
FIG. 1.



Stages in Development of the Method Employed.

These considerations led us to deviate in both directions from the frequency of application in our standard experiment. Our synthetic tars were applied to the skins of animals only once a week or once a fortnight, while mineral oils were applied daily, five times a week. Two experiments with a pinene synthetic tar have been discussed previously,[1] so that here it will be sufficient to give a graph of the final results (Graph I.).* The feature of interest in these experiments is the early development of the first tumour in the skins which were allowed long intervals of rest from contact with the carcinogenic agent, and the subsequent falling-off in the number of tumours developing as the skins acquired a tolerance for the agent. The control animals of the standard experiment were unable to react to the too powerful agent until a tolerance had developed, when the tar was what may be considered 100 per cent. active, or—what comes to the same thing—when the skins were 100 per cent. responsive to this particular agent.

FIG. 2.



From these results it seemed obvious that to obtain the steepest graph with a very powerful agent it would be necessary to commence the experiment with applications at long intervals and gradually to increase the frequency of the applications to keep pace with the skin tolerance developed.

We conducted an experiment wherein the 44 applications of an experiment lasting 22 weeks were not equally distributed over the whole course of the experiment. Two applications were given during the first month, 4 during the second month, 12 during the next six weeks, 18 during the following six weeks, and 8 during the last two weeks. In Graph II. will be found the results of painting the animals 2–16 times per month compared with those of the standard experiment, wherein the animals were painted 8 times per month.

The experiment was very unsatisfactory owing to a poor batch of animals. For this reason there were no early tumours—i.e., the occasional very susceptible animal usually found among each batch was absent. The general development of tumours was later than that among the controls until the seventeenth week, when in both experiments all animals remaining alive were bearing tumours. At this stage of the experiment the controls had received 34 applications, while the batch painted 2–16 times per month had only received 27 applications. In this respect the experimental results were in conformity with our anticipations, but we are not satisfied that they are reliable, and the experiment is being repeated.

Our first oil experiment consisted in the daily application of shale oil to the backs of 100 mice five times per week. The refined sample of shale oil used had a moderate degree of carcinogenic activity, being somewhat less powerful than the average gas tar but very much more active than any American petroleum oil we have tested. The results of this experiment were in accordance with our expectations. The first tumour appeared during the ninth week after the commencement of the experiment, and at the twenty-third week the few animals remaining alive all bore tumours. The first tumour appeared among the animals of the control standard experiment also in the ninth week, but at the twenty-third week only 41 per cent. of the animals living bore tumours. Malignancy supervened six weeks earlier in the animals painted five times per week than in the controls, and Graph III. shows that the general development of tumours among the more frequently painted animals reached a high level much more quickly than among the controls.

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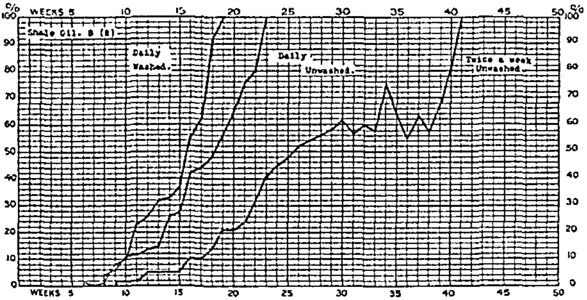
[1] Jour. Hyg., 1928, xxviii., 219.

* The graphs are compiled from the percentage of living animals which bore or had borne tumours at the end of each week since the commencement of the experiment. As 100 animals were used for each experiment and the duration of the experiments was not long, in order to make the graphs clearer the death-rates have not been included.

The effect of the frequent application of the American petroleum oils was then tested, and it was found that tumours developed earlier than when the oils were applied only twice a week.

Oil No. 3, a highly refined Pennsylvanian oil, applied twice a week to two groups of 100 animals, gave rise to the first tumour in the thirty-fifth and the thirty-eighth week respectively, while among the animals painted five times a week the first tumour appeared as early as the eighth week, and it had become malignant by the twelfth week. Malignancy did not occur among the control animals until the fifty-ninth week. Similarly, oil No. 9, a refined Californian oil, which in two standard experiments induced a tumour in the nineteenth and the fourteenth week, when applied five times a week induced a tumour in the remarkably short time of two weeks. By the tenth week 10 per cent. of the animals remaining alive bore tumours, while among the control animals painted twice a week no tumours had arisen at this stage.

FIG. 3.



Three further samples of refined lubricating oils are being applied to animals frequently, but it is too early to draw definite conclusions from the experiments, although the hyperplastic response of the epithelium can already be seen to be excessive as compared with that found in the standard experiments. Meanwhile we have been unsuccessful in inducing tumour formation by the daily application of two oils, No. 4, a liquid paraffin, and No. 12, a sperm oil, which had given us negative results in our standard experiments over 85 and 70 weeks respectively.

When we began our investigations on the carcinogenicity of lubricating oils we endeavoured to obtain a reliable method of concentrating the active principle to enable us to make a more rapid diagnosis of a particular sample than was possible when using the whole oil. It appears from our results with the daily applications that we have here a reliable and even quicker method than that of the bi-weekly application of the concentrated oils. Whether daily application of the latter will still further shorten the period necessary for diagnosis is doubtful, although we are proceeding to test this possibility.

The Protection Offered by Animal Fats.

It has been shown that, if the superfluous tar which may remain on the back of the animal from a previous painting is removed by petroleum ether before the next application, tumours develop more rapidly than in control animals where the tar is not removed. It was imagined that these results were due to the removal of the hard cake of tar, thereby permitting an easier penetration of the active substances which were contained in the fresh tar. A more likely explanation seems that the petroleum ether removed the natural skin fats so that the tar could penetrate more easily than when applied to untreated skin.

We have found that tumour development is very much delayed if, during the intervals of painting of animals with a potent carcinogenic agent, an emollient oil, such as anhydrous lanolin, is smeared over the skin to soften it and to protect it from the air.

In our first lanolin experiment 100 mice were painted twice a week with a very potent synthetic tar, and on two days between each application lanolin was smeared over the painted area. It was at once noticed that the hair was much less inclined to fall than among the control animals painted only with tar, but nevertheless the few first tumours appeared very early, possibly for the same reason as that given when discussing the early tumours in animals painted with tar at infrequent intervals. Subsequently tumour development among the lanolin-treated animals fell behind that of the control animals, while the tendency for malignancy to supervene was remarkably low.

Graph IV. gives a good idea of the protective action of lanolin; during the middle of the experiment, when conditions may be considered relatively stable, the lanolin delayed the advent of tumours by about 3–4 weeks.

A further confirmatory experiment consisted in the utilisation of shale oil instead of the synthetic tar, when the protection offered by the lanolin was even more clearly shown. The experiment has been in progress for 30 weeks without the advent of a single tumour, while among the control animals untreated with the lanolin at this stage of the experiment 61 per cent. of the animals remaining alive were bearing tumours and 21 per cent. malignant tumours. Not even one or two very early tumours developed in the treated animals, which fact accords with our experience that the shale oil is only a moderately powerful agent. As by this procedure we were unable to demonstrate any carcinogenic activity of the shale oil we performed a more severe test on the protective action of the lanolin. Animals are being painted daily with the shale oil and later in the day a small amount of lanolin is being smeared over the painted area. Also we are investigating the effect of adding a small percentage of lanolin to the shale oil and subsequently applying the mixture daily. It has to be remembered that animal fats are sometimes utilised for the blending of mineral lubricating oils, which may be an important factor in the number of tumours arising in certain groups of spinners. Also, if it is true that wool-spinners do not suffer from epithelioma to the same extent as cotton-spinners, the explanation may lie in the fact that a small quantity of animal fat is intermixed with the oil in the wool-spinning rooms, while no animal or vegetable oil contaminates the mineral oils in the cotton-spinning rooms. Incidentally, our results with the lanolin and our results from washing experiments, about to be described, lend support to the thesis that ichthyotic and xerodermatous skins are more liable to be the seat of epitheliomata than are normal skins.[2]

Removal of the Natural Fats.

The protection offered to carcinogenic agents by the application of a small quantity of an animal fat led us to conduct experiments in the opposite direction—i.e., to remove the natural fat of the skin when in contact with and before the application of the carcinogenic agent.

The first experiment consisted in daily application of shale oil to mice five times a week, and the subsequent daily removal of the oil with ordinary soap and water. Each day 200 animals were painted with the oil in the early morning, and about six hours later the oil was removed from the painted area of 100 animals by soap and water, the skins being rinsed with pure water and dried with cotton-wool to remove excess of soap. The manipulations being made with care, the animals tolerated the treatment extremely well, and it was found that the death-rate compared favourably with that of the controls.

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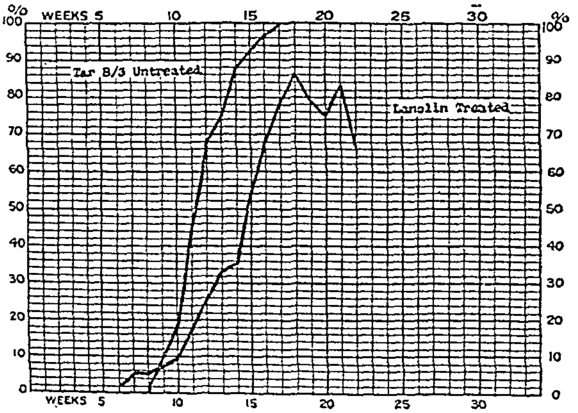
[2] Savatard, L.: Proc. Roy. Soc. Med., May 19th, 1927, p. 1589

Graph III. shows that tumour formation was not delayed by the washing; in reality it was somewhat hastened, despite the fact that the epithelium of the washed animals had only been in contact with a superfluity of the oil one quarter the time of the control epithelia.

Our results were different when dealing with less active agents such as American petroleum oils. Two similar washing experiments were performed with oils Nos. 3 and 9, the Pennsylvanian and the Californian oils. With oil No. 3 the first tumour among the washed animals appeared one week after the first tumour among the unwashed animals, the tumours appearing in the ninth and eighth weeks respectively. With the Californian oil the first tumour in both groups of animals was observed as early as the second week. However, as the experiments proceed, it is found that tumours are not arising so frequently among the washed animals as among the controls, so that it appears that partial removal of the oil with soap and water does offer some protection to the noxious action of these weak oils.

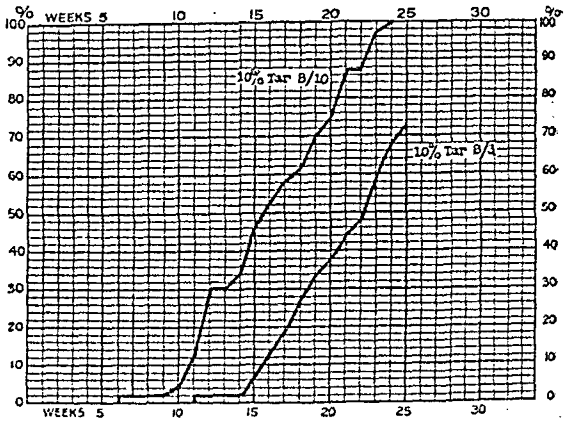
In view of these results we thought it advisable to lessen still further the duration of contact of shale oil with the skin, when we imagined that we should arrive at a contact time in which tumour formation among the animals would fall behind that of the controls. Accordingly 100 animals were painted five times a week with shale oil No. 8, and each day the animals were washed with soap and water one hour after the oil had been applied. In this group of animals the first tumour appeared in the fourth week, an exceedingly early date for the development of a shale oil tumour. We have so far had no more tumours, but the death-rate among the animals has been very high and the experiment will presumably have to be repeated. As a result of this experiment a further 100 animals are being painted with shale oil which, as far as possible, is being removed immediately with soap and water, in order to get an idea of the minimum time it is necessary for the oil to be in contact with the skin for a tumour to supervene.

FIG. 4.



We nave used soap and water to remove the superfluous oil because of its use in ordinary life. We have, of course, appreciated the fact that only the surface mineral oil and some of the natural skin fats are removed by this mechanical means. Presumably minute quantities of the mineral oil would not be removed but would be rubbed into the pores of the animal's skin, and this residual oil might be sufficient to give rise to new growth formation. On the other hand, a carcinogenic agent may exert practically all its toxic action immediately on being applied. In consideration of these possibilities we have initiated a further experiment wherein the oil is removed by a solvent instead of soap. Shale oil is being applied to 100 mice, and six hours later it is being removed by petroleum ether. In another experiment we are removing the natural fats with the same solvent immediately before the daily application of shale oil. In the former experiment the first tumour was observed in the fifth week, while in the latter the first tumour made its appearance in the third week.

FIG. 5.



The Effect of Dilution of the Carcinogenic Agent.

Closely related to the question of the frequency of application of a carcinogenic agent is that of the degree of its activity and consequently of its dilution. In order to obtain a true criterion of the relative potency of any given agent it is necessary to vary one's experimental procedure according to the presumed strength of the agent. Thus when dealing with a strong agent, such as our pinene synthetic tar, we have found that dilution of the fractions extracted was an easy means of getting at the difference of potency of two or more fractions which in the pure state had given almost identical results. When dealing with very weak agents, concentration gives the greatest amount of information.

For example, two Pennsylvanian oils Nos. 1 and 3, when applied as the whole oils, gave results similar to two other Pennsylvanian oils Nos. 7 and 11 which were obtained from a different business source, and there was little to indicate the presence of very active carcinogenic substances among their constituents. Distillation experiments showed, however, that in oils Nos. 1 and 3 there was a small quantity of very active substances; concentration of oil No. 3 by means of methyl sulphite confirmed the distillation results. On the other hand, distillation of oils Nos. 7 and 11 gave no fractions more toxic than the whole oils, and methyl sulphite extraction failed to concentrate to the same extent as in oil No. 3.

We have, as a rule, used ordinary medicinal liquid paraffin as an inert diluent, although this substance may exert a slight protective action on the skin epithelium. Graph V. is compiled from the results obtained by the application of two fractions of a synthetic tar, diluted ten times with liquid paraffin which in the pure state gave results so closely resembling one another that it was impossible to say which was the stronger. When both the fractions were diluted the difference in the carcinogenic activity was at once evident. As the concentration of the active principle in our tar fractions is becoming higher and higher we are diluting still further, and at present we are utilising dilutions as great as 1 in 100.

We have performed several dilution experiments with shale oil, as this is important from the practical point of view. A 10 per cent. and a 20 per cent. solution of shale oil in liquid paraffin have so far failed to induce the development of a single tumour among 200 mice when applied twice a week, in one case for a year and in the other for a lesser time. However, in practice shale oil is not blended for lubricating purposes with liquid paraffin but with a natural petroleum oil, and it is interesting to note that the activity of a weak American petroleum oil is increased by the addition of a small quantity of shale oil. Thus the addition of 5 or 10 per cent. of shale oil to our Pennsylvanian oil No. 11 gave a blend which, when applied to mice twice a week, induced a tumour as early as the fourteenth and the tenth week respectively, while in the control experiment with the pure oil No. 11 the only tumour observed in an experiment lasting 60 weeks did not make its appearance until the *forty-ninth* week. Also this tumour remained benign, while the first tumour which developed when using the 10 per cent. shale mixture had become malignant by the twentieth week. It may be mentioned that 200 animals painted with blends of shale oil and oleic acid responded like those treated with blends of shale oil and liquid paraffin. These results indicate that the autolysed scrotal excreta and desquamated epithelium may not play such an important part in the genesis of mule-spinners' cancer as has been imagined by some workers.

In order to get an idea of the actual amount of carcinogenic agent it was necessary to apply to the skin for tumour development to supervene, dilution methods were of little use. The beneficial or harmful action of the diluent itself rendered the interpretation of the results difficult. Also the application of definite minute quantities of the pure oil is impracticable. To overcome these difficulties we used a weak solution of oil in a volatile solvent, so that only a trace of the pure oil would be left on the back of the animal after the evaporation of the diluent. A 1 per cent. solution of shale oil in petroleum ether was applied daily in our first experiment; up to the present time we have obtained several tumours, but the experiment has not been in progress very long.

Conclusions.

1. The early development of tumours is not facilitated and may even be delayed by the too frequent *application of a potent carcinogenic agent.* With a weaker agent the more frequent the applications the earlier do tumours appear to develop.

2. Similarly, the dilution of a potent agent does not materially affect the time of arrival of the early tumours, while the dilution of a weak agent may render it apparently inert.

3. The carcinogenic activity of a very weak American petroleum oil appeared to be increased considerably by the addition of a small percentage of shale oil. On the other hand, we failed to induce tumours with a blend of a small quantity of shale oil with medicinal liquid paraffin.

4. If the skin of animals which have been painted with shale oil are washed with ordinary soap and water *a few hours later the incidence of tumour* development is not lessened but may even be increased. The removal of the natural skin fats is presumably harmful. With weaker agents, such as American petroleum oils, the washing seems to offer a certain amount of protection.

5. If lanolin is applied to the skin in the intervals between synthetic tar applications the development of tumours is substantially delayed. In the case of a less potent agent, such as shale oil, the lanolin has, in our experiments, given absolute protection, and no tumours have so far developed in the lanolin-shale oil treated animals.

THE DEATHS OF MERCHANT SEAMEN IN 1927.

BY FLEET-SURGEON W. E. HOME.

THE Board of Trade Return,[1] which includes the deaths on vessels registered in the United Kingdom in 1927, tells us that the "first crews" of ships in that year included 161,800 British, 19,000 foreign, and 55,100 Lascar seamen, among whom 1223 deaths were reported. No suggestion is made of a death-rate for any of these groups, but in 1926 a census was taken of the seamen employed, and the number found on board on the census day was for British seamen 80 per cent. of "first crews," and for Lascars 90 per cent. So, to get a nearer idea of the population at risk, of the ration strength from day to day, it will be better to take these proportions of the first crews as stated—namely, for the British 131,000, for the Lascars 50,000, and with these figures to calculate the death-rates, as the nearest approximation possible.

The total British deaths were 853 (6·48 per 1000), of which 408 (3·10) are attributed to disease, 22 (0·16) to alcohol (a reduction), 40 (0·30) to suicide, and 362 (2·82) to accidents. The total Lascar deaths were 240 (4·98), the corresponding figures being disease 182 (3·64), alcohol 1 (0·02), suicide 13 (0·26), and accidents 47 (1·00). Rather more than half the total deaths were thus due to disease. The chief named causes of death from disease were, for British seamen, tubercle 48 (0·37), pneumonia 42 (0·32), malaria 17 (0·13), enteric fever 16 (0·12), and for Lascars, tubercle 37 (0·74), pneumonia 33 (0·66) beri-beri 14 (0·28), malaria 12 (0·24). It will be *noticed that the death-rates from tubercle and* pneumonia for Lascars (0·74 and 0·66), who need only have 72 cubic feet of space in their ships, are roughly double those (0·37 and 0·32) of the British seamen, who must have each 120 cubic feet. During the last four years (1024–7) deaths from tubercle of lung and tubercle "other" have been separated in the return, and if they are assembled and the death-rates on *"first crews" are calculated, we get the* figures, for pneumonia, British 0·3, Lascar 0·6; and for lung tubercle, British 0·17, Lascar 0·6 per 1000, the British having a half-rate for pneumonia, and for phthisis a quarter-rate of that of the Lascars.

By the help of the census figures and those of deaths for 1926, given in the return for 1927, it is possible to make a very approximate estimate of the occurrence of deaths among seamen in sail, steam, and motor-ships, from which it appears that 1634 men were employed in sail, with deaths 4·3 per 1000 from disease, and 11·0 from accidents; 187,536 men, in steam, with deaths 3·8 from disease and 3·1 from accident; and 7338 men in motor ships, with deaths 3·0 from disease and 2·3 from accident. It will be noted, however, that the number in sail was very small, the total deaths being, sail 25, motor-ships 39, steam 1289 in the year 1926.

MEDICINE AND THE LAW.

Prosecution of Unregistered Practitioner.

Lieut.-Colonel J. W. Kynaston, late R.A.M.C., appeared at Marlborough-street police-court on May 15th on two summonses, alleging that he had falsely pretended to be a doctor of medicine and had wilfully and unlawfully used the title of "M.R.C.S. Eng." contrary to the Medical Acts. It was stated for the prosecution that he had been placed upon the *Medical Register in 1885, and it was explained that the* Medical Act of 1886 created a different and additional qualification for registration. The defendant had become duly qualified as a Member of the Royal College of Surgeons of England and a Licentiate of the Royal College of Physicians of London. Seven years ago his name was removed from the Register for what was described as, and found to be, "infamous conduct in a professional respect." That did not imply criminal conduct; the explanation was that Colonel Kynaston was convicted of advertising. The Royal College of Surgeons thereupon withdrew its diploma and the Royal College of Physicians expunged his name from the list of licentiates, but recorded that an application for restoration of his licence might be considered after two years. Mr. G. D. Roberts, who prosecuted, said that the defendant was practising at Langham-place and was doing two things which he was not entitled to do; he called himself "doctor" and put this word in front of his name on his brass plate and in advertisements; he was also using the description "M.R.C.S." This, said Mr. Roberts, implied that he was registered under the Medical Act. Counsel seems to have stated the position with fairness. He disclaimed any idea that the defendant was a quack; Colonel Kynaston had the skill to maintain his qualifications. A man not on the Medical Register was entitled to practise in the same way as a medical practitioner, but he must not pretend that he was on the Register or lead the public to believe that he was a registered practitioner. The Register was the hall-mark of professional skill and professional honour. Evidence was given by Mr. G. F. S. Cowell, secretary of the Royal College of Surgeons. In cross-examination, he agreed that he had not asked the defendant to return his diploma after being struck off the Register; the diploma was, it seems, still in Colonel Kynaston's physical possession. Other evidence was given of the draft of an advertisement sent by the defendant for insertion in the *Radio Times*. Colonel Kynaston went into the witness-box and described the circumstances of his removal from the Register: "I did not appeal against the decision of the General Medical Council which I held, and have always held, to be ultra vires, but I admit de facto that my name is not on the General Medical Register; my complaint is, that I have been illegally removed from it." "You never thought it right," remarked the magistrate, "to test it in the High Court." The defendant rejoined that he could not afford the expense; but, if he were to be prosecuted and brought before a criminal court, he proposed at the earliest opportunity to ask the Court of Chancery to say whether or no the General Medical Council had acted within its jurisdiction. "With regard to the title of doctor," he added, "I have been addressed as 'doctor' for 20 years; in the ordinary acceptance of that term I am a doctor; I have never pretended to be a doctor of medicine, it is no false pretence to say I am "M.R.C.S." or "L.R.C.P.," because I have the diplomas in my possession." Mr. Cancellor, the magistrate, adjourned the case sine die, as there was no time to finish it; the parties would have notice of the resumed hearing.

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[1] Return of Shipping Casualties, &c., for 1927. H.M. Stationery Office, 1928. Pp. 8 2s.

The further proceedings will be awaited with interest. On the general question of the jurisdiction of the Medical Council it is well settled that there can be an appeal to the High Court, but that the High Court leaves the Council to judge in matters affecting the medical profession and refuses to intervene unless some principle of natural justice is violated—e.g., if a defendant has not been informed of the charge against him, or has not had adequate chance to reply thereto, or if the tribunal has acted with bias. The question whether in the circumstances of the present proceedings Colonel Kynaston has been guilty of a false pretence is presumably a question of fact for the magistrate or (on commitment for trial) for a jury. The issue whether it is correct to say, "once a 'M.R.C.S.,' always a 'M.R.C.S.'" is a part of the question of fact. Similar circumstances existed, it may be recalled, when Colonel Kynaston was prosecuted at the Central Criminal Court in November, 1926, on a charge of aiding and abetting the obtaining of a dangerous drug while not a registered medical practitioner. His conviction on that occasion was upset by the Court of Criminal Appeal on the technical ground that the prosecution had in part based the proceedings on the Dangerous Drugs Act of 1925, which at that time had not yet come into operation. It will not be satisfactory to either party unless a definite decision can be reached upon the merits of the case.

The Proceedings against Mr. Raphael Roche.

We are informed that "the officers of the Society of Apothecaries of London, having had the opportunity of investigating the alleged matters of complaint against Mr. Raphael Roche, have satisfied themselves that he had not contravened the provisions of the Apothecaries Act, 1815; and, having obtained from him the subjoined undertaking, the Society are glad to be able to announce that there is now no reason for invoking the powers vested in them under the aforesaid Act." The undertaking signed by Mr. Roche includes the statement that: "I hereby undertake that I will not, in the course of my work, act in such a manner as to contravene the provisions of the Apothecaries Act, 1815, relating to acting and practising as an apothecary."

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

The Content of a General Practice.

A PRACTITIONER, in a city of 15,000 people in a populous Eastern State, has analysed his diagnosis file containing some 6200 diagnoses entered during the last eight years. He admits that some of the commoner complaints among his patients have doubtless been omitted from the file. In spite of this, and of the natural uncertainty about the rigid classification of certain cases, the results are of considerable interest in showing approximately what are the demands upon a general practitioner in this country. Medical cases number 2499, or 40 per cent. of the total, and surgical cases 1497 (24 per cent.); whilst the following numbers are attributed to the other branches of practice: obstetrics 471, pædiatrics 345, dermatology 322, neurology 274, laryngology 254, gynæcology 156, genito-urinary diseases 140, otolaryngology 100, orthopædics 81, and ophthalmology 73. Among the medical cases colds (281), bronchitis (285), and influenza (290) were the most common, while the inclusion of one case each of Banti's disease, aortitis, tapeworm, and pulmonary embolus shows how long the practitioner may have to wait to use a large part of the knowledge acquired in the schools. The importance of minor surgery in this practice is rather striking; there were 683 cases of trauma and 348 of infection. The pædiatric cases are mostly contagious diseases, to which must be added a number of the diseases of early infancy which would naturally be associated with the obstetric work. Only two cases of rickets are recorded, three of enuresis, and five of malnutrition. In obstetrics placenta prævia was encountered once, eclampsia four times. Of the diseases of eye, ear, nose and throat, the commonest were tonsillitis (333), laryngitis (96), otitis media (64), conjunctivitis (24), foreign body in eye (30), and sinus infection (24). Among the conditions occurring once only are iritis, ectropion, retropharyngeal abscess, and—pyorrhœa! This practitioner's conclusion that more time should be devoted to minor ailments in the medical schools may be justified, but not many will agree with him in wanting the time of education to be allotted in proportion to the frequency of diseases encountered.

Death of Haley Fiske.

The death of the president of the Metropolitan Life Insurance Company removes from our midst a pioneer in preventive and industrial medicine. His belief that it is a main function of the business of life insurance to promote health has exercised a remarkable influence on the lives of the 25,000,000 citizens of this country and of Canada who are served by the organisation, of which he was president. It was in 1908 that the decision was reached to make a health campaign amongst the policy-holders. Since then more than 535 million health pamphlets have been circulated, and an important nursing service has grown up. It is calculated that, as a direct result of this campaign, more than 350,000 lives have been saved at an economy in death claims to the company of $70,000,000. Less than half this sum has been expended on the health campaign work.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Aviation in the Service of Medicine.

THE First International Congress of Sanitary Aviation has been a great success, 40 nations or dominions sending delegations. Great Britain was represented by Air Vice-Marshal David Munro and Group-Captain Martin Flack; Australia by Dr. Parks and the Rev. Mr. Flynn; Canada by Captain Williams, head of the Canadian Sanitary Service; and India by Air Vice-Marshal Munro.

Colonel Schickelé (France) and Captain Chochup (Japan), who reported on the use of sanitary aviation in war, consider that the speed of medical aircraft should be 175 kilometres per hour with a range of 500 km. Aeroplanes for the medical services should be gathered together at the beginning of a war out of the available commercial material. It was pointed out that the campaign in Morocco has shown what may be expected of air evacuation, 4500 wounded being brought rapidly to hospital from the front. Colonel Sprich said that before aeroplanes were used there were no "severely injured" in the Morocco hospitals, because they never got there alive.

Among the other topics discussed was the immunity of medical aircraft in warfare and medical aviation at sea. Dr. Garsaux and Dr. Behague discussed the effect of air transport on the patients themselves; for instance, they asked, should men wounded in the brain be carried by air? To this question they thought no positive answer could as yet be given. The use of aircraft in peace-time was the subject of reports by Dr. Tilmant (France) and Dr. Krzys-Koroski (Poland), who urged the need for preparing landing-grounds in great number. A very interesting film was shown to illustrate transportation to hospitals in Sweden, where sick and wounded are carried south from the snowy plains of Lapland to hospitals 300 or 400 kilometres distant. The aeroplanes are equipped with skis or floats for snow or water, according to the place of landing.

At the end of its meeting the Congress passed resolutions to the following effect: (1) That the nations represented should make every possible effort to extend and develop sanitary aviation. (2) That everything should be done in peace-time to make travel easier for medical aircraft, especially by giving them a permanent priority on landing-grounds, and by granting them free crossing of frontiers. (3) That landing-grounds should be as many as possible, especially in countries lacking ordinary means of communication. (4) That encouragement should be given for the conversion of commercial aircraft to medical uses either in peace or war by easy and prompt modification of equipment. (5) That manufacturers should be given moral and material encouragement in their attempts to improve the study and building of medical air material. (6) That international agreement should be reached as soon as possible on the status of medical aeroplanes granting them neutrality in warfare.

The next Congress will study: the equipment, staffing, and security of medical aircraft, and the medical and surgical contra-indications of transportation of wounded by air. A permanent committee will have its offices at the Aero Club of France, 25 rue François Ier, Paris. The president is Prof. Richet (Paris), the vice-presidents being General Bauer (Sweden), General Rouppert (Poland), and Prof. Di Nola (Italy).

Mr. R. Charlet, the secretary, is a dental surgeon. He is president of the Paris University Air Club, and is the man who first conceived the idea of the Congress. Having organised it from beginning to end, he deserves congratulations for the remarkable success achieved by a year's very heavy work.

Midwives and Social Insurance.

The new law on social insurance should come into force in April, 1930, and those implicated are studying the effect it is likely to have on their work. Midwives, whose service will now be almost wholly paid for under the insurance scheme, are only now beginning to organise themselves, and it was not until last week that they set up their "syndicate" for Paris and suburbs, under the presidency of Mlle. Mossé. They are now trying to form a single national confederation with the other syndicates, some of which are already associated in local groups. In negotiating with the Government a national body has many and obvious advantages.

Cocktails.

That alcoholism is now commoner among the smart set than among the working classes was the assertion of Dr. Guillain, professor of clinical neurology, in a recent lecture before the Academy of Medicine. The noxious habit of taking cocktails before meals, now acquired by young women of the "best world" accounts, he said, for their developing disorders that before the war were the prerogative of the hospital classes. One must now go to the houses of the wealthy to find alcoholic polyneuritis, since only rich people can afford the price of highly toxic drinks. Prof. Guillain gave his colleagues some receipts for making the best-known cocktails, and the Academy concluded its deliberations by passing a resolution intended to draw the attention of the upper classes to the dangers of absorbing these poisonous substances. This and similar warnings lose much of their effect, however, through the non-participation of most of the newspapers, as they do not care to get into trouble with the "alcoholocracy" in this country, which is neither more nor less powerful than it is in the rest of the world.

The Last Influenza Epidemic.

The Société Médicale des Hôpitaux has had a special discussion on the forms of influenza observed during the recent outbreak in Paris. The pulmonary symptoms seem to have been much the same as in 1918–19, though less severe. Toxæmia was the real cause of death in many cases, in which the lesions found post mortem did not seem sufficient to explain the rapid termination of the illness. Dr. Hallé gave an interesting account of a family whose members reacted to influenzal infection by various different nervous symptoms, such as nystagmus, sialorrhœa, headaches, and mental confusion.

In the course of the discussion Prof. Netter expressed his view that influenza and encephalitis are separate diseases with their own viruses. He thinks that everything pleads for their separation though, of course, there is as yet no absolute proof of this.

Prof. César Roux, the celebrated surgeon of Lausanne, has been awarded the title of "Doctor Honoris Causa" of the University of Paris.

Dr. Lesné, of the medical staff of Paris hospitals, specialist in pædiatrics, and General Rouvillois, professor at the military medical school of the Val-de-Grâce, have been elected members of the Academy of Medicine.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Health of County Galway.

THE Department of Local Government and Public Health has drawn the attention of the Galway County Board of Health to the advisability of recommending the county council to appoint a county medical officer of health, and has stated that the Board of Health would be incurring a grave responsibility if further postponement were permitted. It was further pointed out that the incidences of infectious disease was far too high in the county. During the past two years 70 cases of enteric fever and 184 cases of diphtheria had been reported from the County of Galway. These figures, which pointed to extensive disregard of proper sanitary precautions, were much in excess of other counties in the Irish Free State, and indicated the necessity for a centralised county control of infectious diseases. The money spent in maintaining institutions for the treatment and isolation of preventable disease would cover the cost of beneficial schemes for prevention of disease. In Connemara there was a chronic smouldering infection of typhus fever, with periodic outbreaks which exacted a heavy cost both in human life and in money. Modern sanitary methods would eradicate this disease, as had been done in other countries. During the year 1926 a widespread outbreak of encephalitis lethargica occurred in County Galway, about 100 persons being affected. Those cases were not reported to the Minister, and as there were no local facilities for coördinated supervision, a valuable opportunity for studying the disease and, perhaps, preventing further outbreaks, was missed. There was great need for the establishment of a system of medical inspection of school-children in County Galway, and the care of expectant and nursing mothers was awaiting attention. It was added that as the port of Galway was becoming an important centre for immigration and emigration, it was prudent that it should be under the supervision of an expert medical officer of health. After discussion the Board of Health referred the letter of the Department to the county council without making any recommendation.

Medical Certification of the Insured.

The National Health Insurance Commission has addressed a letter to the several medical certifiers, drawing their attention to an alleged laxity and irregularity in the issue of certificates of incapacity for work. It is stated that although in the year 1928 the number of insured persons in the Irish Free State was less by 26,000 than in 1925, the number of certificates issued rose from 831,000 in 1925 to 1,145,000 in 1928. At the same time less expenditure on sickness and disablement benefits rose from £410,000 to £562,000. The Commission states its opinion that, in the absence of any evidence other than the certificates to show a corresponding increase in sickness, the growth of expenditure is due largely to laxity in certification. In support of this view it is pointed out that of 20,000 cases referred for second opinions under the District Medical Referees Scheme in 1928, less than 40 per cent. were found on examination to be incapable of work. The Commission declared its intention of exercising a closer control over the work of the medical certifiers. An analysis is being recorded in regard to each certifier showing (*a*) the result of the testing of his certification by the medical referee, and (*b*) the result of a scrutiny of the blocks of the certificates issued by him quarter by quarter. These records will be borne in mind in deciding on the action to be taken when complaints are made against individual certifiers. It is added that, unless a substantial improvement is made in the standard of certification, the Commission will take the step of terminating the agreements with certifiers who refuse or neglect to comply with the terms of their contracts. Moreover, in any case in which a medical certifier may be found, after investigation, to have made a false or misleading statement in connexion with the issue of a medical certificate, the Commission will not hesitate to report the case to the Medical Registration Council.

It has, unfortunately, to be admitted that there is a certain amount of lax certification by medical certifiers. This is made the most of by certain officials of the approved societies who are anxious to obtain for the societies the right to provide certifiers under their own control, and, therefore, miss no opportunity of finding fault with the present system. The letter of the Commission appears to take an altogether exaggerated view of an admitted evil.

National University of Ireland.

Dr. Denis J. Coffey, President of University College, Dublin, and Vice-Chancellor of the National University, has been reappointed to represent that University on the General Council of Medical Education and Registration.

Registration of Dentists in the Irish Free State.

The Register of dentists set up by the Dentists Act, 1928, came into existence in the Irish Free State last week, and it is now illegal for anyone to practise dentistry in the area of the State unless his name is on the Register. The conditions of admission to the Register are similar to those for admission to the British Register.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Care of the Feeble-minded.

THE Edinburgh District Board of Control some years ago purchased Gogarburn House and Estate, with 58 acres of land, and later added the adjoining estate of Kellerstain, with 361 acres. In 1923, when these transactions were carried through, financial stress hindered the immediate development of these estates as homes and colonies for the feeble-minded; but in March, 1927, the first sod of the service roads was cut. The institution will ultimately contain blocks of dormitories, laundry, stores, hospital, and additional staff quarters. Two dormitories, each with 50 beds, are completed and two more will be built. When the present scheme is brought to a close, there will be accommodation for 500 feeble-minded persons, and the plans permit of extension to 1000. The institution is meant to serve not Edinburgh alone, but all south-eastern Scotland. It is to provide for the detention of adult defectives and for educable children under 16 years of age, the usual occupations being provided. The entire scheme is expected to cost more than £400,000, about half of which will be borne by the Treasury.

An associated institution, on the same grounds, is in contemplation for the treatment of incipient insanity, but this is a separate scheme. The Glasgow District Board of Control has a large home and colony for feeble-minded at Stoneyetts, near Glasgow. The powers of the 1913 Mental Deficiency Act will now be more effectively applied. The reform in local government will no doubt affect the Gogarburn Institution for the better; but the present District Board of Control are to be congratulated on the measures they have taken in the last few years. The conception of a segregation colony has, thanks to the recent agitation by the Scottish Women Citizens, taken full possession of the official mind. The colony at the Royal Larbert Institution is being rapidly developed. All our institutions will obviously be needed, now that we are learning more exactly the numbers of the feeble-minded. The familiar deliverances of several judges that they cannot deal with the feeble-minded because there are no institutions to send them to will soon be a thing of the past.

The New Principal of Edinburgh University.

The Principalship of Edinburgh University, rendered vacant by the retirement of Sir Alfred Ewing, which takes effect at the close of the present session, has been accepted by Sir Thomas Henry Holland, K.C.S.I., Rector of the Imperial College of Science and Technology, London. Sir Thomas is President-elect of the British Association, which is meeting this year in South Africa, and he is not expected to arrive in Edinburgh until about the middle of October. He is in his sixty-first year. Joining the Indian Civil Service in 1890, he held many important appointments in India before returning to this country in *1909 to become professor of geology and mineralogy* in the University of Manchester, a post which he held until 1918. In 1915 he became President of the Institute of Mining Engineers; in 1920 he was appointed a member of the Governor-General's Council of India; and from 1924–25 he was Vice-President of the Royal Society.

Addressing the Summer School of Social Study at Rothesay, Dr. J. Parlane Kinloch, Chief Medical Officer of the Department of Health for Scotland, said he had reached the conclusion that the present arrangement whereby health visitors are required to devote their whole time to health visiting from the central offices of a health department, and are largely divorced from actual nursing, is essentially bad. If the public health nurse and health visitor is to fulfil her function she must have clinical association and actual participation in nursing work, for unless doctors and nurses continually receive fresh inspiration by actual contact with medical and nursing work they are bound to become stale. Dr. Kinloch urged united action by the authorities of all the nurses' training schools to establish in each of the principal regions of Scotland a complete training school for health visitors and nurses.

At the annual general meeting of the Scottish Branch of the Smoke Abatement League on May 3rd Colonel P. S. Lelean, Professor of Public Health in the University of Edinburgh, mentioned an experiment carried through in the Warrender Park district of Edinburgh. In that area 4800 windows of flats occupied by an educated and good class of citizen had been kept under observation. It was found that in the summer only 1 in 12 windows was wide open, and only 5 in 12 were open at all. These were appalling figures, and showed the lack of education in public health matters.

In the thirty-eighth annual report of the Glasgow Royal Cancer Hospital it is stated that the ordinary income was £7668 and the ordinary expenditure £9527. Extraordinary income, &c., amounted to £7143. The report refers to the recent gift of £10,000 by Lady Burrell for the purchase of radium. In order to obtain the best results, the directors have decided to form a radium institute, and with that object have purchased a property adjoining the hospital. The institute will be under the supervision of a full-time medical officer, and will be available for the treatment of patients in Glasgow and the West of Scotland, whilst it is also hoped to be able to lend radium to other hospitals in the neighbourhood.

Dr. W. M. McAlister, deputy physician-superintendent of the Royal Edinburgh Hospital for Mental Diseases, lately spoke to the Edinburgh Soroptimist Club on the Modern Treatment of Mental Disorder. He pointed out that in every mental hospital about 70 per cent. of the population is a chronic population, which is a deplorable state of affairs. It is out of the apparently trivial disorders outside the asylums that such cases develop, and the remedy is not a simple one. Hitherto people have been content to see things growing, and then to step in and try to alleviate the damage. The real beginning of treatment lies in the formative years of the child's life. The treatment is not of an individual, but of a situation, and the aim is prevention before definite symptoms have arisen. To achieve this aim requires the coördinated help of social worker, health visitor, teacher, psychologist, and alienist.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

Barnstaple Rural District.

We have received from Dr. J. R. Harper the first health report for the year 1928. The estimated population of his district was 19,180; the birth-rate was 12·9, and the death-rate 12·5. The 240 deaths included 122 male and 118 female. Twice as many females as males died from cancer and tuberculosis, the rates from these causes for both sexes combined being 1·56 and 0·78 per 1000 of the population respectively. On the other hand, there were 28 male deaths and 20 female from heart disease and 12 deaths of male infants to 2 deaths of female infants. The total rate for heart disease was 2·4 and the infant mortality-rate was 56·9 per 1000 births. Influenza was not so prevalent as in 1927 and only caused 2 deaths as compared with 17, the death-rate from respiratory diseases and influenza being only 0·8 per 1000 of the population. Schools in eight parishes were closed on account of measles in the early part of the year; one school was closed for 12 days for disinfection on account of scarlet fever; and one for eight days on account of chicken-pox. A maternal death-rate of over 8 per 1000 births was occasioned by two deaths, one of them from sepsis.

Dr. Harper refers to the need for the replacement of unsatisfactory cottages. The Housing (Rural Workers) Act is being utilised. The reconditioning of 13 houses was begun during 1928, and the work was completed in the case of three during the year. The County Council has approved two further schemes under this Act. Twelve new "subsidy" houses were completed during the year. The unsatisfactory water-supply at Combe Martin is being dealt with, and it is expected that the new water supply will be available for the village in 1929. The sewage outfall at Combe Martin is to be extended in order to prevent the deposit of sewage on the beach near low-water mark. Samples of milk are examined bacteriologically and the results communicated to the producers concerned. Grade A (T.T.) milk is produced on two farms in the district.

PORT SANITARY AUTHORITIES.

Hull and Goole.

Dr. W. Allen Daley, in his report for 1928, observes that the medical staffs of the city and port have this year been conveniently made interchangeable. In all, 7096 ships arrived and were inspected; also 1157 canal boats and 4431 fishing vessels. These latter, if on long-distance cruises to Iceland or the White Sea had generally better accommodation than had most ships for their crews. Of the ships, 888 had defects; these are separated into three groups: (*a*) defects of original construction, the most notable being no water service to the w.c., 33; (*b*) defects due to wear and tear, leaky ports, 169; leaky decks, 88; (*c*) dirt, vermin, &c., dirty forecastles, 547; verminous berths, 103; insanitary w.c.'s, 77. There were no cases of plague, cholera, yellow fever, small-pox, or typhus on any ship arriving. Opportunity for vaccination was offered to crews, but no application for it was received. Sanitary administration of the port cost £4511, of which £2152 was refunded by the Government. The water-supply of the port is from deep wells and is very pure; the tanks of 95 ships were ordered to be cleansed; in no case was there a written record on the ship of the origin of the water on board. Rats, 7522, were killed on board ships, 1150 ashore—a gratifying reduction of 35 per cent. in eight years. Ships are searched for evidence of recent rat-infestation (photographs are given); if there is no evidence, a "deratisation exemption certificate" is given; if less than 10 rats are suspected on board, a "deratisation by trapping certificate" is given, but if over 10, the ship is fumigated; in default of search, the ship must be fumigated every six months. Over 270 tons of food (imported) were condemned at Hull, but all received at Goole was sound. Aliens arriving were 7401; among the transmigrants 90 were certificated for trachoma, favus, and similar conditions.

Port of London.

In his report for 1927, Dr. W. M. Willoughby mentions that in all 23,233 ships were examined. The latrines of the port have been increased by some 260; a new infectious pavilion was added to the Denton Hospital at Gravesend. The Ministry of Health suggested it might be well to inoculate seamen on the way to the Persian Gulf against cholera, and 137 were so immunised. Schick-testing and immunisation is thought to have freed one training ship from diphtheria, and another, it is hoped, will follow suit. No case of human plague was seen, but 35 dead rats were reported on board a grain ship from South America; of these five were found plague-infected, two brown, three black. The ship was twice fumigated with hydrocyanic acid—once when half-discharged 291 rats killed, and a second time with the holds empty, five found. Small-pox was brought on board a ship at Calcutta on Dec. 7th by a man who developed the disease on the 14th, and died on the 24th. The ship's crew, all but one man who was overlooked, were vaccinated at Suez; no one else but this one missed man took small-pox; he became ill on Jan. 8th, 14 days after the death of the first case. On ships 12,897 rats were destroyed, ashore in the port 11,395; only the five mentioned were plague-infected. There appears to be most confidence in hydrocyanic acid fumigation which kills fleas even quicker than rats. Of unsound food 1813 tons were destroyed or specially dealt with; of 60,659 beef tongues particularly examined, 2 per cent. were found affected with actinomycosis. The chief nuisances detected on ships were: dirty quarters, 1218; leaks in quarters, 102; defects in lighting, 94; in ventilation, 81; in heating, 62; in sanitary conveniences, 47; and 50 crew spaces were verminous. Of venereal disease 133 cases were reported among crews on arrival. It is noted that the total number of cases of infectious disease reported is decreasing, a possible result of greater attention paid in foreign ports.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 11TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 277 (last week 356); scarlet fever, 2166; diphtheria, 966; enteric fever, 37; pneumonia, 1407; puerperal fever, 49; puerperal pyrexia, 126; cerebro-spinal fever, 25; acute poliomyelitis, 2; encephalitis lethargica, 25; continued fever, 1; dysentery, 9; ophthalmia neonatorum, 101. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on May 14th-15th was as follows:—Small-pox, 292 under treatment, 15 under observation (last week 338 and 12 respectively); scarlet fever, 1501; diphtheria, 1636; enteric fever, 11; measles, 117; whooping-cough, 943; puerperal fever, 24 (plus 12 babies); encephalitis lethargica, 109; poliomyelitis, 4; "other diseases," 61. At St. Margaret's Hospital there were 15 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was 1 death from small-pox, 4 (0) from enteric fever, 57 (1) from measles, 6 (1) from scarlet fever, 83 (28) from whooping-cough, 24 (3) from diphtheria, 48 (9) from diarrhœa and enteritis under two years, and 79 (7) from influenza. The figures in parentheses are those for London itself.

The death provisionally classified to small-pox was assigned to West Ham C.B. A second death provisionally assigned to Rochdale C.B. was omitted from last week's return. No great town reported more than 3 deaths from influenza except Manchester with 7 and Bradford with 4. Liverpool reported 15 deaths from measles, Birmingham 7, and Sunderland 6. The mortality from whooping-cough is now diminishing, although Liverpool reports 5 deaths, West Ham, Birmingham, and Manchester 4 each. No great town reports more than 3 deaths from diarrhœa.

The number of stillbirths reported during the week was 327 (corresponding to a rate of 47 per 1000 births), including 65 in London.

Parliamentary Intelligence.

HOUSE OF COMMONS.

WEDNESDAY, MAY 8TH.

WAR PENSIONS ADMINISTRATION.

On the report of a vote of £32,723,500 for the salaries and expenses of the Ministry of Pensions,

Major TRYON, Minister of Pensions, said that the vote of the Ministry was still nearly the largest single vote of all the civil estimates. The Ministry's work affected the weekly budget of nearly a million families and the actual beneficiaries of the Ministry numbered a million and a half—a larger number than had been reached under any pensions system in this country. At the end of the current year they would have spent since the beginning of the war—i.e., during the past 15 years—no less than £913,000,000 on war pensions. By comparison with that sum France would have spent not more than about £500,000,000, and Germany but little more than about £400,000,000. Our expenditure on war pensions had therefore been roughly equal to the expenditure of both France and Germany together. The reason was that our scales of pension were considerably better than those of France and Germany. For example, a disabled man with a 50 per cent. pension—about the average pension rate—drew under the British pension system £52 a year for himself, and a 50 per cent. pension would be never less than £52. In France the same man would draw £23 a year, including a variable bonus. In Germany he would draw £18 a year, including a bonus. This country was prompt to adjust pension scales to meet enhanced prices so that, whoever suffered, the pensioner should not. Other countries did not take this course, and the pensioner suffered; and it was only since those countries had given up the policy of inflation of prices and had attained a stable currency that they had begun to adjust the scales of pension to the altered cost of living. In strict financial theory this country should have been bringing our pension rates down as other countries were just beginning to increase theirs, because our cost of living had gone down steadily since 1919, but the Government decided that pensioners should not suffer a reduction of the scale of pension to which they had become accustomed for years and they decided to stabilise the existing scales of pension.

The estimated expenditure of £53,000,000 represents a decrease of nearly 3½ millions on the estimate of the preceding year. This at the present stage is a normal decrease. It would not last because the principal factors of that decrease were gradually ceasing to operate. The expenditure would, in fact, very shortly show no more than a fall of little more than 1 per cent. a year, and he estimated that over the next ten years the mean expenditure would be about 45 millions a year. But, taking the course of expenditure for the last five years, including the year in which the Labour Party were in office, there had been an annual decrease in the expenditure amounting on an average to round about 3 millions. Indeed, the actual (not the estimated) expenditure of last year showed exactly the same decrease, namely, about 2¾ millions as occurred in his predecessor's year of office. The decreased expenditure was the result of a decline in practically every item of the Bill—administration, medical services, pensions, and allowances. The administrative machinery of pensions would cost this year £1,231,000. There was still a decline in this item of our expenditure. Though naturally enough it was tending to stabilise, there would still be the substantial decrease of 6½ per cent. on the previous year's figure. They were still spending on administration no more than 5½*d.* to every £ of expenditure on benefits to pensioners, as compared with 1*s.* 3*d.* in 1920, the first year of his association with the Ministry. The staff showed a decline in numbers corresponding with the diminution in the volume of work. At March 31st last the staff numbered 6608, a decrease of 800 on the previous year. Roughly one-third of the number consisted of female staff, of whom a large number were employed as nurses in Ministry hospitals; 4100 were men, of whom 96 per cent. were ex-Service men. In pensions and allowances, which accounted for 94 per cent. of the Ministry's expenditure, they would spend this year £50,798,000 for a pension list of, roughly, 950,000 adult pensioners and their dependents. Of the total £27,300,000 went in pensions and cash benefits of all kinds to disabled officers and men; and £23,400,000 to the widows and dependents of officers and men who had lost their lives in consequence of war service. There were, of course, still factors operating in the direction of increased expenditure, but on the whole the net result was a declining expenditure.

Medical Services.

There were two sides of the medical service attached to the Ministry, first, the medical examination for pension purposes, and, secondly, the work of medical and surgical treatment. The medical examination, or boarding, of pensioners for the assessment of their pensions was rapidly diminishing. The bulk of the work was now directed to the making of final settlements or final awards in all suitable cases. He was continually pressed to settle pensions finally both by the men themselves, at meetings in the country, and by Members of that House. The security which these final awards brought was being appreciated as they knew it would be. There were only about 100,000 cases still drawing pensions that were temporary and subject to further review. Their present lines of working were calculated to complete in a few months time practically the medical boarding of all these cases, so far as they were likely to be found suitable, for final award. For many of the men it would probably be found impossible and unfair in their own interests to give final awards, at any rate yet if at all, because they were cases that were actively deteriorating. But for the bulk of cases he hoped that finality might be reached before the present year ended. The other side of the Ministry's medical work consisted of the medical and surgical treatment of cases. The demand for treatment of all kinds continued to show the same decline year by year as had occurred for the last seven or eight years and the hospital accommodation of the Ministry had, of course, been reduced proportionately. The Ministry was still maintaining 17 hospitals of its own with approximately 3000 beds, and had a call on 25 other hospitals under the control of voluntary bodies which reserved their entire accommodation, or the bulk of it, for the Ministry. These provided accommodation for a further 2000 cases. In addition the Ministry made use of civil hospitals to a substantial extent. The number of patients in the Ministry and civil hospitals on March 31st was 5106.

He had taken every possible step to ascertain that the pension system was working justly and adequately, and he had abundant testimony to the fact that the system, as a whole, was working soundly. The time limit was a remarkable example of the unanimity of the three political parties when in office on the subject of war pensions. It was imposed on medical advice in 1921 under a Liberal Prime Minister and a Liberal Minister of Pensions. It received the unanimous approval of that House in the 1921 Act. It was upheld by the Government of Mr. Bonar Law. The Labour Party had promised to remove it, but when in office they not only proposed no change in this House, but maintained it in individual cases which were already arising. The principle was again carefully considered by the present Government, who decided that it should be maintained. In imposing a time limit they had done what every other country had done which enrolled its men in the late war by universal service on British lines. Every country had imposed restrictions of one kind or another on the meeting of claims for disablement by war service as a right for an indefinite period. At the same time they had done what every other country had done in applying this limit. They had qualified the rigid time limit by a procedure for the admission of exceptional cases which could prove that they were genuine cases of war disablement. This qualification had been the work of the present Government. In the small number of exceptional cases of genuine war disablement arising after the time limit he had made special arrangements for examination and if necessary hospital treatment. Between 300 and 400 cases that had arisen beyond the seven years' limit had been pensioned. If the time limit was thrown down it could only throw discredit upon the whole pension system. The system of final awards —the principle of a final settlement of the compensation due for every officer's or man's disablement, wherever that could fairly be arrived at—as it had been worked during the eight years by Ministers of Pensions of all political parties would by the end of this year have brought complete security of their pensions to nearly 500,000 officers and men. The Ministry had adopted the system of correction of error, by which any officer or man who had received a final award, but who subsequently was found to need hospital treatment and who, at the end of his course of treatment was found to be in a condition of disablement which was seriously at variance with the degree of disablement which had been assumed for the purposes of final settlement, could be, and was given further pension. In taking the basis of treatment as both the channel for the discovery of error and the test of its existence, he was satisfied that both his predecessor and he had acted wisely, because medical observation and treatment gave, as they alone could give, a basis of ascertained fact to the existence of error. It had been suggested that, notwithstanding that he had a right of appeal to an independent appeal tribunal within a full 12 months of his award, every man who had had a final award should be given a further right to appeal at any time and an indefinite number of times. Any such proposal must make an end of final awards.

Village Centres.

Mr. F. O. **Roberts** said that a great deal had been done by those charged with the responsibility of dealing with tuberculous men, but he would like to know whether the Ministry had given any consideration to the widening of the scope of operations of village centres which could meet the typical cases of ex-Service men which arose from time to time. The British Legion had a very definite policy on the matter, and from the results which had followed the treatment of cases which had come within their hands and the investigations they had made there seemed now some justification for the conclusion that the proper way of dealing with tubercular ex-Service men was to find a means of giving them some useful work under the most congenial and comfortable circumstances. The neurasthenics were probably the most difficult of all the cases with which the Ministry was called upon to deal, but it was a difficulty which ought to encourage those responsible for administration to even greater efforts in the future with the object of overcoming the difficulties. He urged the need for setting up greater and wider occupational opportunities for dealing with this particular type of patient. Certain avenues had been traversed in this direction, but the best opinion had now come to the conclusion that it was only by finding congenial occupations for these patients that they could hope to do anything to bring them either to a complete recovery or to that partial state which would enable them to lead a happier life. On the general question of treatment Mr. Roberts said that he understood that it took from three to six days before a man who had applied for treatment received a visit from the Ministry's medical officer. He urged that some arrangement should be made to avoid the delay and difficulty which must constantly arise. The men might be attended by local doctors on the production of the award showing that the disability had been accepted by the Ministry of Pensions. He appealed for a continuance of the human touch with pensioners without which none of the exceptional cases were likely to be adequately met.

Post-war Diseases.

Dr. **Vernon Davies** said the House was to be congratulated upon being able to deal with the subject of pensions purely from the non-party point of view. The medical profession was intimately concerned with the question whether justice was being meted out to ex-Service men. When all was said and done it depended upon the skill and accuracy of diagnosis and assessment of the medical profession as to whether any ex-Service man could make a case or not. The doctors had to hold the scales of justice with an equal poise, remembering on the one hand the taxpayer and on the other the pensioner. But they were all agreed that in any case of doubt the pensioner should receive the benefit of it. It was easy, however, to make a mistake, and he would explain to the House, roughly, what he meant. There was a certain class of case which everybody—layman as well as medical man—would recognise as simply due to war injury, such as the loss of an eye, the loss of a limb, or a gunshot or shrapnel wound. There was a second class of case which they were quite convinced was not due to war injuries. Because a man had been in the war it did not necessarily follow that every illness and injury he got was the result of his war service. Such cases as these, therefore, cases which were genuine from their knowledge and cases which were not genuine from their knowledge should not arise. Medical men with a certain amount of experience were equally as certain in other classes of case whether they were due to war injury or not. Members had letters from ex-Service men, apparently very sad cases and perhaps cases of paralysis. A man would say that he was perfectly all right when he went to the war and after five or six years he developed a certain form of paralysis and thought that it must be a case of injury or shock or nervous stress due to the war, but medical men knew that that paralysis was definitely the result of venereal disease. Nothing could cause that paralysis but venereal disease, and therefore they said that it was not due to the war. The medical man by his knowledge was able to give an accurate diagnosis but the layman or the laywoman did not recognise this and thought that injustice had been done. There was a third class of case, the doubtful case even from the point of view of the medical man. Medicine was not an exact science. They were not yet masters of all disease; they did not always know the cause of disease or the prognosis of disease. They had, therefore, a neutral ground where there was room for difference of opinion. What was the proper and right thing to do in that debatable ground? It was to see that they had the highest, the best, and the most competent medical advice before confirming an opinion because they could only depend upon medical advice when they had to decide on the question of entitlement and assessment. People had wondered sometimes whether the Ministry had acted quite as leniently as they might have done, and whether they had been as humane as they might be. He paid, however, a tribute to the kindness and humanity of the Minister who had offered him the opportunity of interviewing any of his medical staff and had arranged a meeting with the Director-General of Medical Services in the Ministry and his deputy. The medical department of the Ministry had three main duties. First of all, they dealt with the boards and the assessment and entitlement of a man's award from the medical point of view. Secondly, they dealt with certification and the necessity of treatment or treatment allowances. Thirdly, there was a non-medical branch which dealt with the supply of hospital apparatus, artificial limbs, &c. Dr. Davies proceeded to describe in detail the procedure followed by the medical boards and officers of the Ministry, and he said that he had satisfied himself that the greatest skill and medical attention was given to cases under review by expert medical men. The medical men attached to the Ministry were absolutely fair and unbiased and anxious to do the best for the ex-Service men. He had come away from a very long interview with the Director-General of Medical Services and his deputy perfectly convinced that the medical department of the Ministry were more than fair to the ex-Service man. Speaking as a medical man, he (Dr. Davies) would not have passed some of the cases which they had passed. He would give an example of a man who had syphilis before the war, and after the war developed symptoms of general paralysis of the insane which came on perhaps a little sooner than might have been expected. The Ministry accepted that as a case in which there had been aggravation due to war service, but he (Dr. Davies) would not have accepted the case. They might have the case of a man who went through the war at somewhere round about 50 years of age, and since then with the advance of years had developed, say, arteriosclerosis. That man had a stroke and got paralysis. Some people would say that such a case should be accepted as due to war service and the man be pensioned accordingly. He was glad to find in that particular case that the Ministry did not regard it as one where the disease had been aggravated. If they could get the idea to prevail throughout the country that the medical profession were a body of honourable men anxious to do all they could for the ex-Service men it would create a better spirit and a better atmosphere and reduce the amount of suspicion. It was not uncommon at the present time to hear it said, "But it is quite easy to get a doctor on one side to say one thing and another doctor on the other to say exactly the opposite." Members of that House must recognise that in surgery and medicine they had not reached the confines of knowledge and one man might with perfect honesty interpret a symptom in a certain way and the next man might with equal honesty interpret that same system in a different way. Very often they did not know which man was right until there was an operation or a post-mortem examination. When it was said that cases have been referred to the Ministry accompanied by certificates from doctors that did not necessarily mean that those medical men gave a false certificate. They gave a certificate according to the best of their ability on the symptoms they had observed, but when they had the opinions of experts—experts on tuberculosis, or neurasthenia, or insanity, or wounds—it was only fair to regard the experience of such an expert with all his experience as of more value than that of the ordinary practitioner. He was always prepared to take the view of an expert whether he agreed with him or not because he felt he had more knowledge.

Mr. KELLY said that while he was prepared to accept the statement of Dr. Davies that the main body of doctors were honourable men, he suggested that mistakes might be made even by experts and specialists. He was not at all sure that they could rely, or must rely, in pension matters upon the certificates handed out by medical men. They had experience of cases under the Workmen's Compensation Act where medical opinion had been accepted by the Court as sufficient to determine whether a man was capable of doing his work. He did not think that it was the function of a doctor to say whether a man was capable of doing his work, and judging by many cases their opinion was not worth a great deal.

Decline in Surgical and Medical Cases.

Lieut.-Colonel FREMANTLE said that with regard to the medical side of pensions administrations he would draw attention to the fact that while a very extensive amount of work in connexion with surgical and medical cases had been done in the Ministry's institutions, there was a very definite decline in the provision made and in the necessity for it, and he wished to know the direction in which this was leading. The number of general surgical cases dealt with by the Ministry had gone down from 2500 at the beginning of 1925 to something like half that number. In a period of just over four years the total number of surgical cases treated had been 64,000, and of medical cases 60,000, while there had been 26,000 neurological cases. Outside the Ministry of Pensions very few people realised the tremendous experience of neurological treatment that had been thus gained. It had been a source of information of immense value to medical science generally and for treatment in civil life hereafter. Now, however, naturally enough, there were fewer cases demanding fewer institutions and smaller staffs. The number of institutions had been reduced from 250 in 1921 to 28, the number of hospitals had been reduced from 75 to 20, the medical staff from 600 to 150, and the nursing staff from 1300 to 360. He would like to know what steps were to be taken to see that all this wonderful equipment and experience was going to be made proper use of. The difficulty of a service of this kind was that, as it dwindled more and more so the resources became more limited and it became difficult to give the same proper and suitable treatment to those patients who remained and to give the same kind of outlook in the service for those who were employed in it, while at the same time valuable equipment, institutions, and services were being lost which might otherwise be used for the general good of the community. He entirely agreed with Dr. Vernon Davies that undoubtedly the medical men who were doing the very difficult work of assessment were *sans peur et sans reproche;* but he had not the same absolute and unremitting faith as his hon. friend apparently had on the results of the judgments of the medical profession. They were all of them liable to make mistakes, even when there might be two or three of them together, and his own experience was that when cases were brought before the Minister in which there appeared to have been any error of judgment even in the higher courts they found themselves satisfied with the action that was taken. Obviously there must be protection for the public; there must be a limit. He believed that as much latitude as possible was given in individual cases, and he supposed they must recognise that while there were cases among their constituents with which they naturally felt sympathy, nevertheless it was a fact that the line must be drawn somewhere.

Reply to the Debate.

Major TRYON, replying to the debate, said that he greatly appreciated the references to the medical service of the Ministry made by Dr. Vernon Davies. He (Major Tryon) admired and respected the works of the medical staff himself and he resented attacks—not in that House—against the doctors of the Ministry of Pensions. An enormous proportion of the medical staff had been in the Army and had served overseas. Very often the man who was applying had not been overseas and the doctor who was examining him had. He thanked Colonel Fremantle for the very interesting points he developed. There were, however, a certain number of subjects on which the House was handicapped because they concerned a number of departments. That applied to the very interesting points which Colonel Fremantle had dealt with.

The Report of the Vote was agreed to.

DONATIONS AND BEQUESTS.—Sir William John Lancaster, of Putney Hill, S.W., in addition to other charitable bequests, left £500 each to the West Norfolk and Lynn Hospital, King's Lynn, the Bolingbroke Hospital, Wandsworth Common, and the Putney Hospital; £100 each to the Royal Hospital for Incurables, Putney, and the Hunstanton Convalescent Home.—Mr. James Stewart Williamson, of Auld Girth, Victoria Park, Manchester, left, among other bequests, £1000 each to the Manchester Royal Infirmary and St. Mary's Hospital, Manchester; and £500 to the Christie Hospital for Cancer, Chorlton-on-Medlock.—Mrs. Fanny Hester Wright, of Crescent House, Southsea, Hants, left £1000 to the Hospital for Sick Children, Great Ormond-street, W., for a cot to be called "The Mickle's Bed."

Correspondence.

"Audi alteram partem."

BLOOD STANDARDS.

To the Editor of THE LANCET.

SIR,—Difficulties with regard to blood standards and with regard to the accuracy of the methods employed must have been felt by everyone who examines blood. Fortunately in the practical application of blood examination for diagnosis, experience shows that the variations in many diseases are in general greater than the sum of all the experimental errors; thus the diagnosis of an inflammatory reaction, as in the presence of pus, will be made by different observers using different methods, and perhaps on counts showing considerable differences. Again, in watching the progress of a case—for example, pernicious anæmia—the fact that successive counts will often be made by the same person using the same method eliminates many experimental variations.

Difficulties must always arise whenever an arithmetical figure is fixed as standard for a varying human characteristic. Consider such simple measurements as those of stature or weight in which there need be no experimental error to be considered. We should not ask what is the "normal height" of, say, adult male human beings, but either what is the "average height" or what are the "normal limits of height," and any figures given for the latter, however elastic they might be, would still be difficult to defend against cross-examination in a witness-box. What we want to know with regard to blood standards for practical or even scientific purposes are not hard-and-fast fixed figures, but rather the various normal limits in order that we may judge what is abnormal. Unfortunately the problems of blood are further complicated by the experimental variations and errors of different instruments and methods of calculation.

With regard to the *total red cell count*, it is surprising that the figure of 5,000,000 per c.mm. can have endured so long in this country. But I remember discussing this point with Pappenheim before the war, and remarking on the higher counts constantly found in Great Britain. To my surprise he defended the figure strongly and stated that 5,000,000 was a correct average for healthy young males in Germany. In this country for a moderately selected group of healthy adult males I would put the figure at 5·5 to 7 million, usually between 6 and 6·5 million; for a group without selection, but no special ill-health, about 0·5 million less throughout.

The *hæmoglobin standards* are even more difficult owing to variations in the instruments. There is a further serious difficulty in that all measurements of hæmoglobin involve matching tints, in which the male sex is notoriously inefficient. This factor may be the explanation of the great differences obtained with the Haldane hæmoglobinometer by Dr. Goodhart and Dr. Jenkins respectively; it is also noteworthy that Dr. Jenkins gets higher readings with the Tallqvist scale than with the Haldane, although the latter is set to the lower standard. Different methods may suit different visions. Personally I always use the Dare instrument. I prefer the principle to Haldane's as several readings can be taken on the same specimen. In a recent test I made the hæmoglobin of a healthy male 92 per cent. on the Haldane instrument and 101 per cent. on the Dare as the mean of several closely similar readings. My standards had just been passed as accurate by a well-known firm which sells these instruments, and both the Dare and Haldane instruments are set to the same standard of hæmoglobin per 100 c.cm. of blood. I find that an inexperienced observer with the Dare instrument usually starts with a reading about 10 per cent. too low and corrects it after a few tests. Clearly it would be an advantage to have all hæmoglobinometers set to a common standard. Even this would leave those variations which are due to differences of vision, and also, no doubt, to differences in various instruments.

Dr. Dyke has mentioned the "hæmoglobin coefficient" of Osgood. According to this "Hæmoglobin is expressed as the number of grammes per 100 c.cm. of blood calculated to a red cell count of 5,000,000." Investigation shows that this "hæmoglobin coefficient" is given by multiplying by the colour-index the number of grammes of hæmoglobin accepted as the standard. Thus on a Haldane instrument, which is calculated to a standard of 13·8 grammes of hæmoglobin per 100 c.cm. of blood, any blood with a colour-index of 1 will give a hæmoglobin coefficient of 13·8. Obviously the "hæmoglobin coefficient" is only a more complex statement of the colour-index and gives no measure of the percentage of hæmoglobin. Osgood may have overlooked this simple resultant of a complicated calculation.

Normal White Count.—In reading Dr. Dykes's article I was especially interested on coming to a section headed Normal White Count, and was disappointed on turning the page to find that the article finished in a few brief lines. The difficulties are very great in arriving at any normal limits, for apart from true variations we must recognise the large experimental variations and errors of our methods. Suppose a blood actually contains 6,000,000 red cells and 8000 white per c.mm., how near are we likely to get in the count, and how far will a series of counts agree with each other? No doubt we would like our students to believe that we could get within 100,000 of the red and 100 of the white. Probably a more correct statement of the range is 10 per cent. of the total count, and not less than ± 100,000 for reds and ± 100 for whites, excluding extreme counts. Thus for 6,000,000 reds the range would be from 5,700,000 to 6,300,000, and for 1,000,000 reds from 900,000 to 1,100,000.

But the difficulty is far greater with the *differential count* of leucocytes. It is well known how erratically the various cells are distributed on a slide. There are wide differences between the distribution at the edges and the centres and at the ends. Some years ago a team of experienced laboratory workers attempted to investigate this question systematically. The differences which they obtained between different methods and between each other may be judged from the title of the article in which they recorded their results: "Have Differential Leucocyte Counts any Value?" Considering differential counts, I believe that for a series of counts of 500 cells on the same blood the range of variation for a cell is about the square root of its percentage. If the percentage of polymorphs is 64 various counts will lie between 60 and 68. For counts of 200 cells the range is about half as much again. Supposing a blood has correctly for polymorphs, lymphocytes, large hyalines (large mononuclears), and eosinophils, percentages of 64, 25, 9, and 2 respectively, the range of a series of counts of 500 cells will lie approximately without fractions, between 60, 27, 10, 3, and 68, 23, 8, 1, and for a series of counts of 200 cells between 58, 28, 11, 3, and 70, 22, 7, 1. No count ever reaches the accuracy of a decimal point, though perhaps for convenience 0·5 may be admitted for mast cells and eosinophils.

In spite of all difficulties some standard of normal limits for the differential count must be set before students and kept before ourself for comparison. I would suggest the following: Polymorphonuclear neutrophils 60 to 75, eosinophils 2 to 4, mast cells 0 to 1, large hyalines (mononuclears) 4 to 8, lymphocytes 15 to 35. The great difficulty is the limits of the neutrophils. Many good authorities would put the lower limit at 50. During the war counts between 50 and 60 per cent. were extremely common, but possibly these were not entirely normal. Of course the total count of leucocytes must always be taken into consideration together with the differential count when questions of abnormalities arise. For this reason the students at St. Bartholomew's are taught from the outset to calculate the total number of each cell and compare them with the normal total numbers. This is quite rational, but used as a routine must involve much unnecessary calculation.

Coagulation Time.—The standard of this has not been referred to in the discussion, but it is greatly in need of consideration. Recent work, especially that of Christie in Edinburgh, has shown how greatly and constantly the coagulation time varies in the first few drops. After the third drop a normal coagulation time at 37° C. is under a minute and may be under half a minute. At 25° C. the time is sufficiently lengthened to be a nuisance. Possibly a temperature of 30° C. would give a coagulation time long enough to be accurately estimated in various circumstances without being tediously prolonged.

I am, Sir, yours faithfully,

London, W., May 10th, 1929. H. LETHEBY TIDY.

THE NEW IMPORTANCE OF RADIUM.

To the Editor of THE LANCET.

SIR,—In reply to Dr. Douglas Webster, I should not like to be misunderstood. I have not forgotten the valuable pioneer work done by Prof. Lazarus Barlow, Prof. Sidney Russ, and Dr. Webster at the Middlesex Hospital with radium en masse, but when I referred in my letter to distant "bomb" therapy I had in mind something rather different from half gramme surface application.

I am, Sir, yours faithfully,

London, W., May 17th, 1929. C. GORDON-WATSON.

Dr. A. E. Barclay writes to express regret for the omission in his letter which appeared last week of any allusion to the exceedingly good work in the radiation treatment of cancer done at St. Bartholomew's Hospital.

PATHOLOGICAL POSTURES.

To the Editor of THE LANCET.

SIR,—The questions raised by Dr. Brain indicate that in criticising certain forms of appeal to phylogenesis I have not made my position quite clear, and I am glad of the opportunity of stating the case more precisely. Dr. Brain's proposition that "there is nothing inconsistent between a physiological and a biological explanation" is surely a truism, since the former is necessarily the latter. My complaint is against a biology that is not biological; in short, against the clothing of what is, in fact, pure allegory in the language of biology. The comparison of the mobile spasm of athetosis with the hypothetical tree-climbing antics of our ape-like ancestors is neither more nor less than this. There is not even the degree of superficial resemblance between the movements of athetosis and those of a monkey climbing a tree necessary to lend an air of plausibility to this fantastic analogy. Further, in the observed behaviour of the decerebrate sloth we have an indication that Dr. Brain's interpretation of the flexed arm of hemiplegia is in all probability a figment of a like order. Therefore, what was spoken of as "the appeal to phylogenesis" in the lecture criticised by Dr. Brain might more accurately have been styled "the allegorical method in neurology."

On the other hand, the conclusion that certain tonic reflexes seen in the human subject with spastic hemiplegia are physiologically identical with postural reactions observed and described by Magnus and de Kleijn, rests upon no such insubstantial basis of speculation. It is not an explanation of a present, of which we know something, in terms of a past of which we know nothing, but it is the fruit of a careful correlation by numerous observers of facts of experimental and clinical observation.

Having accepted the physiological relationship of two groups of phenomena upon a sound observational basis, we may—if we will—proceed to consider the possible phylogenetic significance of our findings. To such a rational sequence of steps in investigation there cannot be, nor have I raised, any objection. But I cannot accept Dr. Brain's suggestion that conclusions so reached constitute "a phylogenetic explanation" of the same order as are the allegorical examples I have cited. The fact is that, although using the same terminology, we are not speaking the same language.

Reduced to its simplest terms, the position that I was endeavouring to maintain in my lecture, and that Dr. Brain is in effect disputing, is one expressed by Bacon in the proposition: Non fingendum, aut excogitandum, sed inveniendum, quid Natura faciat aut ferat.—I am, Sir, yours faithfully,

London, W., May 18th, 1929. F. M. R. WALSHE.

THE FREQUENCY OF RED HAIR.

To the Editor of THE LANCET.

SIR,—Some years ago (THE LANCET, 1922, i., 1270) you were good enough to print the casual fact that in 1921 nine of the 750 (1·2 per cent.) graduands of the University of London were red-headed; in 1922 there were 16 in 961 (1·7 per cent.). To my surprise I learned the other day that someone had found a use for these numbers. It is therefore perhaps worth recording that the tedious splendour of degree-day this year revealed six in 1157 or 0·5 per cent., a doubtfully significant decline from the older figures.

I am, Sir, yours faithfully,

Radlett, Herts, May 21st, 1929. A. E. BOYCOTT.

THE EYE AS A DANGER SIGNAL OF DENTAL SEPSIS.

To the Editor of THE LANCET.

SIR,—I shall be obliged if you will make a correction in your report of the paper read by me at the International Congress of Military Medicine on Friday, May 10th. I said that in an unexpected number of persons between the ages of 20 and 40 years slight opacities of the lenses are found, and that in a large proportion of these I attributed the cause to the marked dental sepsis which was present. Also I said that I found that in a consecutive series of 100 patients who came for refraction, and who attained full visual acuity with glasses, 22 showed radiographic evidence of the presence of apical abscesses.

I am, Sir, yours faithfully,

A. F. MACCALLAN.

Welbeck-street, London, W., May 20th, 1929.

MILLER GENERAL HOSPITAL, GREENWICH.—On May 14th the new extensions to this hospital were opened by the Duchess of York—three new wards, two complete operation theatre units, new kitchens, and a nurses' home. The total cost of the extensions is in all about £118,000, of which £29,000 is still lacking. The President of the hospital, Lord Queenborough, welcomed the Duchess, and drew attention to the wide area served by the hospital. Dr. Harold Pritchard, the senior physician, detailed the 16 specialised departments of the hospital, and singled out for special praise the work of the Lady Almoner's department in befriending the patients and ensuring after-care.

RADIUM IN LIVERPOOL.—At a meeting held in Liverpool Town Hall on May 14th, presided over by the Lord Mayor and addressed by Lord Derby, it was resolved to make an appeal for funds to purchase radium for the treatment of cancer and to establish a radium institute in Liverpool. The sum aimed at is £120,000. The Radium Committee is said to be representative of all the big hospitals in the city and has worked out details of the scheme. The amount of radium in Liverpool is at present very small and many patients have to be sent to Manchester, where is often a long waiting list. Lord Derby suggested that the Radium Fund should be Liverpool's thankoffering for the King's recovery, and this suggestion has been adopted.

Obituary.

ARTHUR HENRY CHEATLE, C.B.E. F.R.C.S. ENG.,

AURAL SURGEON TO KING'S COLLEGE HOSPITAL.

As we have already announced, the death of Mr. Arthur Henry Cheatle, aural surgeon to King's College Hospital, occurred in London on Saturday, May 11th, in the sixty-third year of his age.

Arthur Cheatle was the son of the late George Cheatle and younger brother of Sir Lenthal Cheatle. He was educated at Merchant Taylors' School, and joined the medical school of King's College, whence he took the double diploma of the English Colleges in 1888, and the F.R.C.S. Eng. four years later. He was elected assistant surgeon to the hospital, and from that time forward had charge of the aural department, lecturing on aural surgery, and later being definitely appointed aural surgeon to the institution. He rapidly proved himself to be a pioneer along the pathological and operative lines which his duties placed before him, for it must be remembered that not till the beginning of the present century had the modern surgery of the ear been either reasonably planned or indeed devised. The results of a spread of infection from the middle ear to structures where absence of surgical relief meant a fatality, but where, at the same time, operative interference was perilous, became recognised about the period when Cheatle took up his practical duties, and from that time forward his name was associated with many fine developments in theory and technique. He showed how the clinical features and progress of infection of the middle-ear tract were influenced by the anatomical type, so that chronic suppurative middle-ear disease had its origin, though indirectly, in a normal anatomical structure. When the mastoid operation was introduced, many surgeons were without precise knowledge of the anatomy of the cavities as they are influenced by the individual development of the subject, by age, and even by sex. In the Royal College of Surgeons of England there is housed a collection made by Cheatle, over a period of 30 years, consisting of a series of some 700 preparations displaying the structure of the mastoid region in its varieties, and demonstrating the influence manifested by the factors of individuality, sex, and age. In this collection, the most complete that has ever been made to illustrate the surgical anatomy of the middle ear and the accessory air sinuses, every specimen was obtained from a subject of known age and sex, and the descriptive catalogue, prepared by the collector himself, is now published by the College for the use of those who come to study the work from all parts of the world. Under Cheatle's supervision about 200 of these specimens were photographed and a series of lantern slides prepared to meet the needs of teachers. Such work alone entitles Cheatle to the grateful memory of his profession and of the public.

The following has been received from D.M., and shows the position which Cheatle occupied in the minds of his co-workers. D.M. writes:—

"Arthur Cheatle's death has removed from the small and rather select band of the scientific otologists of Britain a mind that can ill be spared. Not that his life's work was incomplete, for he was granted time to finish what he had originally set his hand to; but in a branch of medicine in which, for several reasons, the practitioner is exposed to a daily temptation to forsake at times the narrow path of unpleasant truth, Cheatle knew no deviation, no hesitation even. And in the wider world, when easy roads to distinction in a popular sense were indicated to him, he would smile and take his own way, picking his steps and walking clean.

"Selecting for his particular attention as an investigator the structure of the temporal bone, in which lies the organ of hearing, and particularly that part of the bone known as the mastoid process, he emulated Browning's Grammarian in devoting a lifetime to this one small corner, and was rewarded by a discovery that revolutionised ideas regarding septic infection of the ear and its neighbourhood. Largely as a consequence of his teaching, modern operations on the mastoid, of which everyone has heard nowadays, rest upon a firm basis of anatomical fact. The hours and days and years that Cheatle spent over this single laborious task no one can number; but his monument is erected for all time in the rich collection of his specimens in the Museum of the Royal College of Surgeons in Lincoln's Inn-fields, as well as in the more accurate knowledge of the behaviour of the common purulent disease of the middle ear which he has bequeathed to medicine and to mankind. He was a patient worker, and a cautious theoriser, and, as he was but poorly gifted with expository powers—writing with much difficulty and speaking in public with even greater difficulty—his new teaching was long in making headway even here in England, while abroad his friends were often annoyed—as he was himself, for that matter—to find his discoveries and views, many years after their appearance, given the paternity of some French or German investigator who had apparently never heard his name."

Professional recognition of Cheatle's position was as wide as well merited. He gained the Adam Politzer Prize at the Ninth International Otological Congress, was an honorary member of several foreign otological societies, was a late president of the Otological Section of the Royal Society of Medicine, and in 1913 was president of the Section of Otology at the International Congress of Medicine. When the war broke out he was a member of the medical board of the Royal Air Force, with the rank of lieut.-colonel, and was also hon. consultant in his specialty to many of the military hospitals in the London and Eastern Commands, and was appointed aural surgeon to King Edward VII. and King George Hospitals.

Cheatle's literary work, though not voluminous, was all valuable, and proves his life-long interest in his subjects. Twenty-five years ago he wrote on sight and hearing in childhood with the late Brudenell Carter. He made a report on the examination of the ears and throats of 1000 school-children for public use; he wrote on gun deafness and its prevention; and the Hunterian Lectures at the Royal College of Surgeons of England on the "Surgical Anatomy of the Temporal Bone from Birth to Adult Life," were published in 1907 as a volume. These lectures contained a thorough, detailed and accurate description of the temporal bone both from the anatomical and surgical standpoint, the three most instructive chapters in the book setting out the relation of the lateral sinuses to the surfaces, the consistence of the outer antral wall and mastoid process, and the variations in the middle ear and antrum. The excellent illustrations made the book welcome as much to the anatomist as to the surgeon.

To "D. M.," also, we owe the following picture of the private side of Cheatle's life:—

"To those," he writes, "who knew the inner tragedy of Cheatle's life, a poignant loss by death in his early manhood, his devotion to work looked like a way of escape from tormenting memories, the reaction of a lofty mind to a sorrow ineffaceable, inexpressible. It was, indeed, in the circumstances, a salutary refuge, for Cheatle's was a proud and lonely nature, shy and slow to make men friends, though warm, responsive, and even playful with those who knew how to reach to the sensitive soul that hid behind the veil of his aloofness. When to this we can add that he was a man of fine presence, tall, straight, with clean-cut features and speaking eyes, we may succeed in conveying some faint outline of the impression his singular personality made upon those who knew and admired him for what he was no less than for what he did."

Sir Arnold Lawson writes:—

"Arthur Cheatle was one of my oldest friends. We were schoolboys together and nobody, more than myself, is now in a stage of transition. The new statutes have now come into force, and the allocation of accommodation on the new site in Bloomsbury is now exercising the attention of a committee under the chairmanship of Sir William Beveridge. Provision has already been made for the inclusion of an administrative block, a library, a great hall, and of adequate housing for the Union Society.

University College.—The examination for the Bucknill Scholarship of 160 guineas and for two exhibitions of 55 guineas each will begin on June 25th. The subjects of the examination are chemistry, physics, botany, and zoology. Entry forms should be obtained from the Secretary of the College not later than June 1st.

University of Manchester.—On May 15th the honorary degree of doctor of science was conferred on Sir Ronald Ross, F.R.S.

Dr. Louis Savatard has been appointed assistant lecturer in dermatology.

The new Robert Angus Smith scholarship of £150 for research in sanitary science is offered for competition. Particulars may be had from the registrar of the University.

In connexion with the meeting of the British Medical Association at Manchester in July, the honorary degree of doctor of laws will be conferred on Lord Dawson, and on Drs. W. J. and C. H. Mayo, of Rochester, U.S.A., and the honorary degree of doctor of science on Sir Ewen Maclean, president of the Association, and Dr. C. O. Hawthorne, chairman of the representative body.

Royal College of Surgeons of Edinburgh.—At a meeting of the College on May 15th, with Mr. Alexander Miles, the President, in the chair, the following 30 successful candidates out of 85 entered, who passed the requisite examinations between Jan. 3rd and 12th, were admitted Fellows :—

Herbert Abernethy, Robert Erwin Austin, Harold Shaw Bilcliff, Bernard Brooks Blomfield, Donald Cameron Bowie, Rangachari Padmanabha Chari, William Noble Chisholm, Johannes Gerhardus Albertus Davel, Glyn Alexander Davies, Harry Geoffrey Estcourt, John Langwell Farquharson, Donald John Davidson Henderson, Richard Anthony Highmoor, Albert Edward King, Mangalore Copal Kini, Eric Roy Lange, Charles Gordon Lewis, Alan John Grange Mackay, Vasudeo Shankar Schoholkar, Samuel Newson, William James Pannell, Lindsay Morgan Park, Lawrence Vernon Pearson, Lindsay Sangster Rogers, Madan Copal Saincher, Christopher George Schurr, Bam Narain Sewal, Graeme Gibson Talbot, James Reid Wheeler, and George Wood.

The Bathgate Memorial Prize, consisting of bronze medal and set of books, after a competitive examination in Materia Medica, was awarded to Mr. Wai Ming Tso.

The following candidates, having passed the requisite examinations, received the higher Dental Diploma :—

Cyril Grosvenor, H. D. Kendrick, and G. E. Morgan.

Royal Medical Benevolent Fund.—At a recent meeting of the committee 51 grants were made amounting to £1204. This is the largest sum of money voted in any one month since the Fund was founded. The committee also elected five beneficiaries to Alexander Lawrence Annuities, the annuities being £70, £65, £60, £60, and £52. The following are short notes on five of the cases helped by grants :—

Widow, aged 50, of M.R.C.S. On the death of her husband in June, 1928, was left with an income of £50 a year and two daughters to educate. Her husband had served throughout the war and during service began a disease which undermined his health and which led to his death at the age of 51. The Officers Association will contribute £30 yearly towards the school fees of one child, and the Fund has voted £40 for the school fees of the other. The widow is trying to augment her income by taking paying guests.

M.R.C.S., aged 60, is suffering from paralysis. His wife and child of 5 is dependent on him. Private income £128 a year. Voted £40.

Daughter of L.K.Q.C.P., aged 61, has supported herself through life as governess and companion. Of late years she nursed and kept house for a delicate married sister who has now died and she is left dependent on her brother-in-law who is suffering from advanced tuberculosis. Voted emergency grant of £10 and £26 in four instalments. R.U.K.B.A. and R.A.M.C. fund will also coöperate and help this case, which is one of complete destitution.

Widow of L.R.C.P., aged 72, on death of her husband was left with an income of £67 a year. Voted £36.

Widow of M.R.C.S., aged 80, is a feeble old lady and in very straitened circumstances. Since the death of her husband in 1912 she has had to gradually use up her capital. She has now sold her last security which has realised £220 ; she has only this left to live on. Voted £36.

Subscriptions and donations should be sent to the hon. treasurer, Royal Medical Benevolent Fund, 11, Chandos-street, Cavendish-square, W. 1.

Walsall Hospital.—It has been decided to appoint an honorary consultant surgeon and an honorary consultant physician for general work, and two junior assistant surgeons are to be added to the staff to provide opportunities for the younger medical men in the area.

Pay Beds at Acton.—The Council of Acton Hospital, W., have arranged to accept patients in private wards at a charge of £4 4*s.* weekly ; a semi-private ward will cost £3 13*s.* 6*d.* These patients may be attended by their own doctors, with whom they will arrange operation fees ; £1 1*s.* will be charged for the use of the theatre, radiographs, pathological tests, &c.

Enlargement of Addenbrooke's Hospital.—The sum of £90,000 is required for enlargement of Addenbrooke's Hospital, Cambridge, and at the launching of an appeal on May 11th Mr. C. R. W. Adeane, the President, was able to announce that £10,000 had already been received. This includes donations of £2000 each from Mr. G. R. C. Foster and Miss A. Peckover, and £1000 from Mr. Arthur Cooke, senior surgeon of the hospital. The new plans for extension provide for a block of three storeys on the north side, facing the out-patient department, and this block will contain a children's ward and beds for 20 paying patients. An additional surgical ward for women is also to be constructed, and 29 extra bedrooms will be available for the nursing staff. Certain older parts of the hospital will be reconstructed, and the total number of beds gained will be 92.

Work of Children's Hospitals in London.—In presiding last week at the annual meeting of the Queen's Hospital for Children, Hackney-road, the Duke of York stated that this institution deals with a larger number of children than any hospital of the kind. Last year there were 1818 in-patients and 32,708 out-patients. It was reported that the increased efficiency of the public health services had, during the last three years, reduced the number of out-patients.—The annual report of the Paddington Green Children's Hospital shows that the average cost of the 835 in-patients was £7 16*s.* 7*d.*, and that contributions from parents amounted to £1017. The Extension Building Fund now reaches something over £6000 towards the £50,000 required, £958 of which was produced by a wireless appeal.—The Infants Hospital in Vincent-square, Westminster, last year treated 748 in-patients, an increase of nearly 100 ; the out-patients numbered 15,551, an increase of more than 4000.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Monday, May 27th.—8 p.m., Odontology (at the Royal College of Surgeons, Lincoln's Inn-fields, W.C.). Election of Officers and Council. Sir Frank Colyer will give a short description of the work carried out in the Museum during the past year.

Tuesday.—5 p.m., Medicine. Election of Officers and Council. 5.30 p.m., General Meeting of Fellows. Ballot for election to the Fellowship.

Thursday.—7 p.m., Electro-Therapeutics. Election of Officers and Council at the Langham Hotel, Portland-place, W.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos-street, Cavendish-square, W.

Friday, May 31st.—8.30 p.m. General Meeting. Paper by Col. L. W. Harrison : Review of Experimental Work in Syphilis and its Possible Bearing on Man. A discussion will follow.

SOCIETY FOR CONSTRUCTIVE BIRTH CONTROL.

Thursday, May 30th.—8 p.m. (at Essex Hall, Strand, W.C.). Dr. Mather Thomson : The Sterilisation of the Unfit.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

Monday, May 27th.—2.30 to 5 p.m., Medical Surgical, and Gynæcological Clinics. Operations.

Tuesday.—2.30 to 5 p.m., Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

Wednesday.—2.30 to 5 p.m., Medical, Skin, and Eye Clinics. Operations.

Thursday.—11.30 a.m., Dental Clinics. 2.30 to 5 p.m., Medical, Surgical, Nose, Throat and Ear Clinics. Operations.

Friday.—10.30 a.m., Throat, Nose and Ear Clinics. 2.30 to 5 p.m., Surgical, Medical, and Children's Diseases Clinics. Operations.

NATIONAL HOSPITAL, Queen-square, Bloomsbury, W.C.

Monday, May 27th.—2 p.m., Dr. Riddoch : Out-patient Clinic. 3.30 p.m., Mr. Leslie Paton : Papillœdema (1).

Tuesday.—2 p.m., Dr. Walshe : Out-patient Clinic. 3.30 p.m., Dr. Critchley : Pick's Disease (Cortical Sclerosis).

Thursday.—2 p.m., Dr. Kinnier Wilson : Out-patient Clinic. 3.30 p.m., Dr. Gordon Holmes : Lesions involving the Optic Chiasma (1).

Friday.—2 p.m., Dr. Adie : Out-patient Clinic. 3.30 p.m., Dr. Symonds : Neurosyphilis (2).

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

Monday, May 27th.—5 P.M., Dr. J. A. Drake: Streptococcal Infections of the Skin.

Tuesday.—Dr. W. N. Goldsmith: The Nervous System in relation to Skin Diseases.

Thursday.—Dr. W. J. O'Donovan: Skin Diseases of Animals Transmissible to Man.

Friday, Dr. W. Griffiths: Bullous Eruptions.

UNIVERSITY COLLEGE, Gower-street, London.

Tuesday, May 28th and the following Wednesday and Friday.—5.30 P.M., Prof. A. Brachet: Experimental Embryology.

Wednesday and Friday.—5.30 P.M., Prof. E. D. Wiersma: The Psychology of Dementia (First of two public lectures).

Thursday, 5 P.M., Mr. R. J. Lythgoe: Special Sense Physiology. (Fifth of six lectures).

ST. THOMAS'S HOSPITAL, Albert Embankment, Westminster Bridge, S.E.

Thursday, May 30th.—5 P.M., Prof. S. J. Cowell: Dietetics. (Fifth of six lectures).

UNIVERSITY OF BIRMINGHAM.

Thursday, May 30th.—4 P.M. (In the Medical Lecture Theatre, Edmund-street Building), Dr. H. Charles Cameron: Some Types of Septic Infection in the Newly-born. (Second Ingleby Lecture.)

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

Tuesday, May 28th.—3.30 P.M., (at the Jessop Hospital), Mr. Stacey: Labour Complicated by Contraction of the Pelvis.

Friday.—3.30 P.M., Mr. Finch: Prostatic Enlargement.

Appointments.

Bell, W., M.D., Ch.B. Edin., has been appointed Medical Referee under the Workmen's Compensation Act for Bradford, Keighley, Skipton and Settle County Courts.

Miller, H., M.B., Ch.B. Edin., Hon. Surgeon to the Northern Infirmary, Inverness.

Westminster Hospital: Rodgers, T. S., L.R.C.P. Lond., M.R.C.S., and Biclenky, D., L.R.C.P. Lond., M.R.C.S., Resident House Physicians. Priest, W. H. D., L.R.C.P. Lond., M.R.C.S., Resident House Surgeon.

Certifying Surgeons under the Factory and Workshop Acts: James, W. E., L.R.C.P. Lond., M.R.C.S. (Rhayader, Radnor); and Walker, W. A., M.B., Ch.B. Glasg. (Irlam, Lancaster).

Vacancies.

For further information refer to the advertisement columns.

Aberdeen City.—M.O.H. £1100.

Barking Urban District Council.—Asst. M.O. and Asst. School M.O. £500.

Birmingham, City Mental Hospital.—Jun. Asst. M.O. £350.

Birmingham, Dudley-road Hospital.—Jun. Asst. M.O. At rate of £200.

Birmingham and Midland Homœopathic Hospital and Dispensary. H.S. £150.

Blackburn and East Lancashire Royal Infirmary.—Fourth H.S. £130.

Blackpool, Victoria Hospital.—H.S. £120.

Brighton, New Sussex Hospital for Women and Children.—H.S. and H.P. Each £50.

Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.

Cardiff Royal Infirmary.—H.S. Aural H.S. Also Cas. Surg. O. Each at rate of £50.

Carshalton, Surrey, Queen Mary's Hospital for Children.—Jun. Asst. M.O. £500.

Chester Royal Infirmary.—H.S. £120.

City of London Hospital for Diseases of the Heart, &c., Victoria Park, E.—H.P. At rate of £100. Also Laryngologist.

Coventry and Warwickshire Hospital.—Res. H.S. £125.

Derby County Borough.—Temp. Asst. M.O. At rate of £600.

Dover, Royal Victoria Hospital.—H.S. £180.

East Ham Memorial Hospital, Shrewsbury-road, E.—Res. M.O. Also Res. H.P. and Cas. O. At rate of £150 and £100 respectively.

Evelina Hospital for Children, Southwark, S.E.—H.P. At rate of £120.

General Lying-in Hospital, York-road, Lambeth, S.E.—Res. M.O. At rate of £100.

Gravesend and North Kent Hospital.—Jun. H.S. At rate of £80.

Grimsby County Borough and Port of.—Asst. M.O.H. £700.

Harrogate Infirmary.—Jun. H.S. £100.

Hertford County Hospital.—H.P. At rate of £150. Also Hon. Surg.

Hospital for Sick Children, Great Ormond-street, W.C.—H.S. and H.P. Each at rate of £100. Also Res. M.O. for Country Branch, Tadworth, Surrey. At rate of £250. Also Surg. Reg. £300.

Hull Royal Infirmary.—Cas. H.S. At rate of £130.

Kingston and District Hospital.—Third Asst. Res. M.O. At rate of £250.

Lancashire County Council.—Asst. County M.O. £800.

Leeds, St. James' Hospital.—H.P. and S. £200.

Leicestershire County Council.—Asst. County M.O.H. £650.

Liverpool Heart Hospital.—Maurice Stern Research Fellowship. £150.

London Homœopathic Hospital, Great Ormond-street and Queen-square, Bloomsbury, W.C.—Surgeon in Charge of the Orthopædic and Mechano-Therapy Department.

Lowestoft and North Suffolk Hospital.—H.S. £120.

Maidstone, West Kent General Hospital.—Radiologist.

Male Lock Hospital, 91, Dean-street, W.—H.S. At rate of £200.

Manchester, Ancoats Hospital.—Anæsthetist. 10*s.* 6*d.* per attendance. Also H.S. At rate of £100.

Manchester Northern Hospital for Women, &c.—Sen. H.S. Also Jun. H.S. At rate of £130 and £100 respectively.

Manchester Royal Eye Hospital.—Jun. H.S. £120.

Manor House Hospital, Golders Green, N.W.—Jun. H.S. At rate of £200.

Margate Royal Sea-Bathing Hospital.—Asst. Med. Supt. £500.

Middlesex County Council.—Asst. Dental Officer. £500.

Miller General Hospital, Greenwich-road, S.E.—Out-patient Officer. At rate of £150.

Montrose Royal Asylum.—Jun. Asst. M.O. £325.

Newcastle, London-road Institution.—Asst. M.O. £250.

Northampton General Hospital.—Hon. Anæsthetist.

Northampton Mental Hospital, Berrywood.—Locum Tenens M.O. 7 gns. a week.

Northamptonshire County Council.—Tuberculosis Officer. £750.

Nottingham, General Hospital.—Res. Cas. O. At rate of £200.

Preston, Biddulph Grange Orthopædic Hospital.—Jun. H.S. At rate of £150.

Preston, High Carley Sanatorium, near Ulverston.—Asst. Tuberculosis M.O. £450.

Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Asst. Res. M.O. At rate of £80.

Queen Mary's Hospital for the East End, Stratford, E.—Res. M.O. £200. H.P. and Cas. O. £150. Also H.P., Two H.S.'s and Obstet. H.S. Each £120.

Queen's Hospital for Children, Hackney-road, E.—H.P. Also H.S. Each at rate of £100.

Rangoon, Harcourt Butler Institute of Public Health.—Director. 1650 Rupees a month.

Royal Free Hospital, Gray's Inn-road, W.C.—Asst. M.O. for V.D. Clinic. £500. H.P.'s and H.S.'s. Also Obstetric District Asst. £100. Cas. O. £150.

St. Peter's Hospital for Stone, Henrietta-street, Covent Garden, W.C. Clin. Assts.

Salop County Council.—Asst. M.O. £600.

Shrewsbury Eye, Ear and Throat Hospital.—H.S. £200.

South London Hospital for Women, South Side, Clapham Common, S.W.—Asst. Phys.

South Shields, Ingham Infirmary.—Sen. and Jun. H.S.'s. £200 and £150 respectively.

Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S. £150. H.S. for Ophthalmic and Aural Departments. £150. Also Asst. H.P. £125.

Sudan Government.—M.O. £E720.

Taunton and Somerset Hospital.—Sen. and Jun. House M.O.'s At rate of £150 and £100 respectively.

Wakefield, West Riding Mental Hospital.—Jun. Asst. M.O. £400.

Walsall General Hospital.—H.S. At rate of £150.

Walsall and West Bromwich Unions Joint Committee Institutions, Great Barr Park.—Res. M.O. £500.

Warrington Infirmary and Dispensary.—H.P. At rate of £150.

West London Hospital, Hammersmith-road, W.—H.P., H.S., Aural S., and Ophth. H.S. Each at rate of £100.

Western Australia.—M.O.H. £756 to £960.

Willesden General Hospital, N.W.—Registrars.

York County Hospital.—H.P. and H.S. Each £150.

Zetland, County of.—School Medical Officer, &c. £700.

The Home Secretary gives notice that in consequence of the resignation of one of the Medical Referees under the Workmen's Compensation Act, 1925, for the Districts of the Abergavenny and Blaenavon; Crickhowell; Monmouth; and Tredegar, Abertillery and Bargoed County Courts (Circuit No. 24), the appointment held by him is falling vacant. Applications for the post should be addressed to the Private Secretary, Home Office, Whitehall, S.W.1, and should reach him not later than 7th June, 1929.

Births, Marriages, and Deaths.

BIRTHS.

Jack.—On April 7th, at Rawalpindi, India, the wife of Lieut. Colonel W. Morton Jack, O.B.E., I.M.S., of a daughter.

Long.—On May 15th, at Dene End, Stormont-road, Highgate, N., the wife of Dr. Harold Long, of a son.

DEATHS.

Alexander.—On May 14th, at Tigh Beg, Sutton, Archibald Spiers Alexander, M.D., aged 75 years.

Graves.—On May 10th, at Bucknell, Shropshire, Thomas William Graves, M.R.C.S., M.O.H., late of Knighton, Radnorshire.

Guillaume.—On May 19th, 1929, at a nursing home, Wakefield, after a serious operation, Ida Margaret Guillaume, L.R.C.P., L.R.C.S.E., L.F.P.S.G., L.M. (Rotunda), sometime Resident House Surgeon at the General Hospital, Barbados, and the Clayton Hospital, Wakefield, and elsewhere, beloved daughter of the late Mr. Thomas Guillaume and of Mrs. Ada Fanny Guillaume, of Umballa, Sandbanks.

Pollock.—On May 18th, at Maxwell-road, Northwood, Major-General C. E. Pollock, C.B., C.B.E., D.S.O., late K.H.S., and Deputy Director-General Army Medical Services.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

HOSPITAL APPEALS.

What policy should the organisers of hospital appeals adopt? Faced with the rivalry of keen competitors, should they be humdrum or original? Should they invite the donations of the charitable by sober statement and a reasoned enlistment of normal human sympathy, or should they seek to touch some sentimental weakness or even exploit a superstitious fear? A daily newspaper lately announced the withdrawal of a hospital appeal at the instance of the Lord Mayor of London who, as president of the institution, had thought its terms improper. The circular, we are told, set out the needs of a well-known maternity hospital, its building commitments in anticipation of financial support, and the saving of life of mothers and babies if the extended facilities are provided. To stir the imagination, the circular enclosed a pin and asked that the pin be returned with a cheque attached. So far the appeal seems unobjectionable, but there was a figurative description of the pin as a magic pin and a hint that, if the pin were not returned, a mother's life or a baby's life might be lost. What was no doubt intended as a quite legitimate play of fancy was capable perhaps of misunderstanding. The superstitious might regard it as a potent spell; the sceptical might look on it as a mere nuisance, not unlike those "chain of prayer" appeals whereby recipients were warned that to break the chain would involve liability to untold evils. And so the circular was withdrawn and the hospital organisers are left to find some new ingenuity of address. The decision to withdraw the appeal was solely a matter for the hospital concerned; if withdrawal was deemed advisable, no outside comment is necessary. Other institutions will note the incident. Our hospitals are dependent upon the generous support of the charitable public. A fancied indiscretion by one mendicant may check the public sympathy towards others.

THE COMPANIONATE MARRIAGE.

For the last 25 years Benjamin Barr Lindsey has been a Court Judge at Denver, Colorado. In this capacity he has seen the breakdown of the marriages of thousands of couples, and has set forth the conclusions drawn from this experience in book form.[1] In a preface we are informed that "companionate" marriage differs from "trial" marriage. But the difference is one of psychological emphasis rather than of form. A companionate marriage is typically one entered into by young people, and is distinguished from ordinary marriage by the fact that the couple take contraceptive measures to avoid children, and are given facilities for obtaining divorce in the event of their temperaments not proving compatible. They are thus spared having to resort to the hypocrisy and deception demanded by the existing legal procedure for divorce. The difference in psychological emphasis consists in this. The couple embarking upon companionate marriage intend that the marriage shall be a success, while those entering upon trial marriage envisage a divorce as soon as the flame of romantic passion has cooled. The book consists of a compilation of "case histories," presented in the form of racy anecdotes which contain much duologue between Judge Lindsey and others. These anecdotes make light reading. They fully bear out a generalisation made by Mrs. Bertrand Russell in an introduction, which runs as follows: "Roughly speaking, in England, you may say that you believe in almost any form of sexual freedom providing that you do not act according to your beliefs. In America, you may act as you please provided that you say that you do not believe in what you are doing."

It is by reason of its social effects rather than of its contents that this book deserves notice. It has enjoyed a very wide sale in America, and has there exerted a considerable influence. More than perhaps any other book, it has directed attention to the problem of contraceptive technique, which, it is being more and more realised, is an essentially medical problem. The amount of discussion which this book has provoked would suggest that, accompanying the prodigious mechanical changes which are visibly transforming the landscapes of America, there are now in operation social and ethical changes, less conspicuous but perhaps more profound, by which human relationships across the Atlantic are rapidly being transformed.

NEW PREPARATIONS.

Kharophen: Hypoloid Sodium Salicylate (Burroughs Wellcome and Co., Snow-hill Buildings, London).—Kharophen is an addition to the list of amœbicidal agents issued by this firm. It is an acetyl derivative of 3-animo-4-hydroxy-phenyl-arsinic acid, and clinical reports indicate that it is of real value in the treatment of amœbic dysentery. It is claimed to possess considerable advantages over other amœbicidal agents in that it is definitely tonic and non-depressant. It has been used effectively in the treatment of yaws, both in adults and in children. The preparation is put up in bottles of 25 tabloids, each containing grs. 4 (0·259 g.). The tablets are administered by the mouth, one tabloid twice a day for a course of ten days. *Hypoloid Sodium Salicylate* is a sclerosing solution for the treatment of varicose veins by injection. The preparation is issued in strengths of 20, 30, and 40 per cent., in hermetically sealed phials of 5 c.cm. ready for immediate intravenous injection in suitable cases, such as where the need for the astringing medium occurs in pregnancy or menstruation, where hypoloid quinine and urethane might be thought unsuitable

Acidophilus Bacillus Blocks, M-A-B (H. K. Mulford. Co., Ltd., Regent Arcade House, 252, Regent-street, London, W.).—This is a new form of administering the acidophilus bacillus, which normally inhabits the human intestine, predominantly that of the infant and young child. In order to facilitate mass dosage over long periods, the blocks are put up in a concentrated mass culture of Lactobacillus acidophilus in a medium of agar jelly covered with a chocolate coating, the blocks measuring about 1 × ¾ × ½ inches. These are encased in foil which, on removal, presents a sweet with the appearance and taste of a good chocolate confection. The tablets, which are known as M-A-B, are put up in boxes of one dozen, and form a portable and pleasant way of obtaining acidophilus treatment. Each block at the time of issue is said to contain some 150 billion bacilli of the Y type, the number usually present in a pint of comparable acidophilus milk. The recommended dose is from two to four blocks per day for an adult, eaten just before, or two to three hours after meals. For children the dose is half to two blocks daily according to age.

SLUMS IN MANCHESTER.

A book[1] about housing conditions in Manchester, by one who has an intimate knowledge of municipal affairs in that city, will be of value to all individuals, committees, and local authorities who take a keen interest in the slum problem. Statements made at conferences, and even in the House of Commons, often reveal a curious ignorance of many of the factors bearing on the question. Public health officials will find but little matter that is new to them. Here and there even Mr. Simon has failed to understand some of the terms and methods employed in official reports. For instance, the "Registrar-General's standard" of overcrowding is wrongly described on p. 7, and the standard based on cubic capacity, which is really used to a far greater extent by local authorities, is disregarded. Mr. Simon's book would have been of greater value if he had taken cognisance of investigations of overcrowding which have been carried out in towns other than Manchester, sometimes on slightly different lines. The use in this book of the word "re-conditioning" would not be accepted by all those who are interested in this method of dealing with unfit houses. It is doubtful, indeed, if the term has done anything towards clarifying the situation, but if it is to be used, it should not be applied to operations which can more adequately be described by terms which have already obtained the sanction of usage through their embodiment in the wording of Acts of Parliament. Of Mr. Simon's solutions of the slum problem, that of reducing the rates on working-class houses, which are better than the slum houses, has certainly much in its favour, and is in line with an idea to which the public has become accustomed by recent legislation. The proposal to make an allowance on rent according to the number of children would, on the other hand, present many difficulties, and is not likely to meet with ready acceptance. Mr. Simon may care to note that there is no medical officer of health of Camlachie as such, the place being a district in a city which is even bigger than Manchester.

TIME OF DAY IN RELATION TO CONVULSIONS IN EPILEPSY.

Our attention has been drawn to an error appearing in the paper on this subject by Dr. Mary Langdon-Down and Dr. Russell Brain published in our last issue. In the sixth line of the third paragraph on p. 1032, the words "between the hours of 8 A.M. and 2 P.M." should read "between the hours of 8 P.M. and 2 A.M."

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[1] The Companionate Marriage. By Judge Ben Lindsey and Wainwright Evans. London: Brentanos, Ltd. 1928. Pp. 396. Price 10s. 6d.

[1] How to Abolish the Slums. By E. D. Simon, ex-Lord Mayor of Manchester. London: Longmans, Green and Co. 1929. Pp. 146. 4s.

Ingleby Lectures

ON

SOME TYPES OF SEPTIC INFECTION IN THE NEWLY-BORN.

Delivered in the University of Birmingham on May 23rd and 30th, 1929,

BY HECTOR CHARLES CAMERON, M.D., F.R.C.P. LOND.,
PHYSICIAN IN CHARGE OF THE DEPARTMENT FOR DISEASES OF CHILDREN, GUY'S HOSPITAL.

LECTURE I.

ON this occasion it is right that we should remember that it is to obstetricians that the study of pædiatrics owes its birth. Obstetricians were truly the first pædiatricians, the first to devote some special attention to the child, and although in pædiatric hands what was but a by-product of obstetric activities has been worked upon and developed in many new ways and by many new processes, the need for coöperation and a common understanding remains. It is clear that between the two services there can be no complete division of labour, because there can be no precise moment at which the responsibilities and interests of the obstetrician cease and the responsibilities and interests of the pædiatrician begin. At least the study of the neonatal period of life is territory common to both. The obstetrician in all adverse circumstances which may be encountered during pregnancy, labour, or the puerperium must have regard to the effects upon the infant no less than upon the mother. The pædiatrician, sometimes after a considerable interval, must often be concerned with disorders which owe their origin to disturbances beginning before, during, or shortly after birth. Because of this community of interest it seemed appropriate that I should select for consideration some aspect of neonatal disease which might be of interest to both groups of workers.

NEONATAL DISORDERS: THEIR FREQUENCY AND OBSCURITY.

At no time of life is death so imminent as at its first beginnings. In a general infantile death-rate of 82·9 per 1000 live births, more than half of the deaths (45·3) occurred in the first month of life—that is, in the neonatal period. Figures similar to these have been recorded in almost all civilised countries at the present time. To assess the morbidity-rate is not possible, but a death-rate of about 1 in 25 in the first month of life suggests how very frequently disorders not fatal must be encountered. We must remember that the mere recognition of the minor degrees of ill-health in an infant may be no easy matter; to have a clear understanding of how it is ill may be almost impossible. The immaturity and functional instability of the various organs, while favouring the development of symptoms, at the same time obscure their interpretation and diminish the information which at other times of life they may be said to convey. Symptoms such as jaundice, pyrexia, albuminuria, or ketonuria are produced with such regularity and facility that they are commonly described as *physiological*. Even in the presence of undoubted illness they afford little or no indication of the site or nature of the disturbance. The undeveloped state of the cortex cerebri and of all the controlling and inhibitory functions of the brain leads readily to the production of convulsions from the most various causes. Again, from the frequent and explosive passage of green and slimy stools we can by no means infer the presence of an infective enteritis, nor even conclude that the nature of the diet is at fault. Such stools are common in breast-fed infants who are thriving exceedingly, are not to be regarded as providing of themselves any indication for weaning from the breast, and are probably to be explained by a certain physiological hyperæmia with secretory and neuro-muscular hyperactivity, apt to occur in a bowel hitherto inactive, empty, and anæmic. Jaundice, albuminuria, pyrexia, convulsions, diarrhœa, may mean very little, or they may mean much. It is not easy to distinguish what is of grave import from what is trivial. We are apt too often to find ourselves suddenly and unexpectedly confronted with death or the danger of death.

ESTIMATION OF THE STATE OF HEALTH OF THE NEWLY-BORN.

The spinal cord and the medulla oblongata are the only parts of the central nervous system which are active at birth and for some time after birth. The cortical cells are indeed present from the first, but they are inactive because the medullation of the white fibres proceeds only slowly as infancy advances. But from the very first the medulla is in full and efficient control because it presides over functions and actions which are vital for the child's existence. An estimate of the efficiency of the circulatory, respiratory, and suction apparatus of the child may, therefore, serve directly as a measure of its general well-being and vitality. Almost all forms of neonatal disorder, cerebral birth injury, for example, states of infection of all sorts or prematurity, alike show themselves in an interference with one or other or with all of these vital functions.

The Child's Power of Efficient Suction as a Most Important Index.

It is perhaps the third of these primitive functions, the infant's power of suction, which, critically considered, constitutes the most useful general index of health and vitality. Interference with the mechanism of respiration, such as results in asphyxia livida or pallida, or the grosser degrees of atelectasis pulmonum, is of too grave significance to serve our purpose in this respect, and is most often to be explained by the presence of gross subtentorial hæmorrhage. Circulatory disturbances, manifesting themselves in attacks of cyanosis, syncope, and capillary stasis, are even more threatening to life. The blood pressure in the newly-born is in general very low. In the first few days of life systolic pressures of 70 mm. Hg, or even less, are frequently recorded. The viscosity of the blood, with its greatly increased content of corpuscles, is high; the left ventricle, not yet grown to meet alone responsibilities which in fœtal life it shared with its neighbour on the right, provides only a feeble force, while the suprarenals, apart from their tendency to suffer partial destruction from intramedullary hæmorrhage, share in the general functional incapacity of all the neonatal organs. These considerations account in some measure for the frequency with which, in the newly-born, and especially in those born prematurely, we encounter attacks of cyanosis and of stasis in the peripheral capillaries, with or without the accompaniment of multiple hæmorrhages. Persistent or repeated disturbance of respiration or circulation, however slight, is a danger signal which must always cause alarm.

But with the act of suction, for a variety of reasons, slighter degrees of impairment are common. In general, vigorous and effective suction is an indication of a vigorous and effective child. The newly-born may indeed be said, with some approximation to truth, to function only as a suction apparatus. Born with almost all other functions in abeyance, it yet possesses this one power in extreme degree and the pressure exercised by the sucking infant, otherwise so helpless, is surprisingly great. Illness of almost any sort results in a diminution in this power, so highly developed, and it becomes an additional and serious complication of all illness, even of illness otherwise trivial, that the resulting loss of suction power is apt to cause the loss of the milk from the mother's breasts.

Neonatal Disease Considered in its Relation to Lactation.

The public, perhaps too the profession, has been unduly slow to realise that when, in the early weeks or months, lactation fails, the explanation is almost always to be found in some diminution in the child's power of suction. So long as the mother can provide a nipple sufficiently well formed to permit of the satisfactory attachment of the suction apparatus, the amount of milk secreted varies directly with the stimulus applied in the infant's suction. Later, in lactation, maternal factors are of greater importance. The mother's age, constitution, general health, diet, and circumstances can then shorten or prolong lactation. But it is in the early weeks that the function of lactation is least stable and most in danger because of the extreme dependance of the young child's power to suck upon its general health.

I have drawn up a list of the conditions in the infant which are from time to time responsible for the failure to nurse, and in almost every case of so-called inability to nurse, excluding those in which the weaning is due to faulty technique or to unwillingness or over-anxiety on the part of the mother, I believe that one or other will be found responsible.

(*a*) *General Weakness.*—Great prematurity or debility.
(*b*) *Dyspnœa.*—Bronchitis, pneumonia, atelectasis, congenital heart disease.
(*c*) *Nasal Obstruction.*—Nasal catarrh, syphilitic rhinitis, narrow choana.
(*d*) *Incoördinate Suction with Aerophagy.*—Nervous unrest and crying, mental deficiency, organic disease of central nervous system, cerebral birth trauma.
(*e*) *Local Conditions in the Mouth, &c.*—Macroglossia, cleft palate, hare-lip, facial paralysis, ranula, ulcers of the mouth and palate.
(*f*) *Acute Infective Illness.*—Sepsis neonatorum, influenza, pyelitis, &c.

A consideration of this list goes far, I think, to explain the frequency with which the human infant fails in a task in which the young of other animals appear almost uniformly successful. In the first place, it is obvious that a litter provides a six or eight cylinder engine, and that if one or other goes out of action for the time being, the resulting loss is negligible. But the mother breast is dependent almost always upon the stimulus from a single infant. If the child ceases to suck, or sucks under difficulties, the involution of the breast begins at once and proceeds rapidly. The frequency of nasal obstruction from nasal catarrh, especially for the infant born in the winter months, is so great as itself to account for a considerable proportion of the cases. But, above all, in the young of no other animal do we find displayed that nervous unrest, insomnia, and violent emotional disturbance which is so common in the human infant, charm the nurse never so wisely. The suction apparatus works effectively only when the child is quiet and in repose. A too eager and purposive suction, which substitutes for the quiet, steady, and efficient reflex act an uncontrolled, incoördinate, voluntary effort, results in the swallowing of a minimal amount of milk and of a maximal amount of air. The breast, drained at first in great and eager gulps, is rapidly relinquished and the infant falls again to crying from the discomfort of the too great gastric distension. Such difficulties are formidable only for the very young infant. The older child grows adept in the art of suction and learns to overcome them.

In dealing with this all-important question of suction, I have been led somewhat to reverse the aspect from which I am considering the subject. For my contention at the moment is not so much that a study of the infant may reveal that defect in the suction upon which the difficulty in lactation depends, but rather that the power of suction affords a most valuable measure of the well-being of the child. All the activities of the newly-born are activities governed by the medulla, and our examination of the newly-born must be directed towards assessing the efficiency of the respiratory and circulatory apparatus, the power to maintain a comparatively stable body temperature, and the capacity for effective suction. The last two provide us with the readiest and most delicate index of the vital stability of the child.

CLASSIFICATION OF NEONATAL DISORDERS.

The high neonatal mortality is due to several factors:—

(*a*) Developmental defects incompatible with life.
(*b*) Gross prematurity which also predisposes to (*c*), (*d*), and (*e*).
(*c*) Sepsis neonatorum and other infections.
(*d*) Functional weakness of particular organs. Jaundice, the hæmorrhagic disorder, disorders of gastric and intestinal peristalsis.
(*e*) Birth trauma.

This neonatal mortality has not, it is said, taken part in that great fall in the general infant mortality-rate which has been so satisfactory a feature of the last 20 years. It is a mortality for which the lack of mothercraft cannot be held responsible. In part, in the grosser forms of maldevelopment and of prematurity for example, it is unavoidable. On the other hand, of recent years striking success can be recorded in the treatment of the hæmorrhagic disorder and of some forms of severe icterus by means of blood transfusion, while all improvements in the art of obstetrics must carry with them a reduction in the incidence both of sepsis neonatorum and of birth trauma.

Perhaps in this connexion I may be allowed to call attention to the quite remarkable success recently achieved by Hampson, working at Guy's Hospital, in the treatment of the grave familial jaundice of the newly-born, by means of repeated injections of the mother's serum intramuscularly. In the families studied by Hampson,[1] there had been 75 fatal cases of jaundice, while 15 infants alone had survived. Since treatment in the same families, there have been 18 cases of this form of jaundice, hitherto so fatal, with 17 recoveries. The single fatal case was seen very late. How common this form of jaundice may be it is at present difficult to say, but experience teaches us that often it is only when a successful method of treatment is found that attention is focused on the disorder and its true frequency revealed. Until 1900, for example, cases of hypertrophic pyloric stenosis were not recognised; to-day, hundreds of successful operations are performed annually.

SEPSIS NEONATORUM.

Its Greater Frequency and Severity in the Past.

To-day, in all civilised countries, as a result of aseptic midwifery and the spread amongst all classes of society of a knowledge of the need for scrupulous cleanliness in the handling of the newly-born, this one-time scourge has greatly declined both in frequency and in severity. Formerly it exacted such a toll of the lives of the newly-born as to-day may well nigh seem incredible. It is but "the shade of that which once was great" which we must be content to study—a shade, it must be confessed, which is apt to lose something of its definition if too high an illumination is attempted. This shadowy character, this want of definition and sharpness of outline nowadays makes the study and even the recognition of the condition by no means easy. The provision of aseptic childbed, if it was a work accomplished in the first place in the interests of the mother, has proved to be of equal benefit for the child. It is to the pages of old books written by men who worked in the lying-in hospitals before Lister lived that we must turn to have brought before us in all its frightfulness what the puerperal infection of the child really was. The picture of sepsis neonatorum, as we encounter it, for example, in the writings of Trousseau,[2] has been banished.

> Of 193 infants born alive, 50 died of the very same affections which proved fatal to the lying-in woman. The most frequent causes of death were peritonitis, numerous abscesses, purulent infection, phlegmonous swellings, erysipelas, gangrene of the limbs, putrid infection, or some other remarkable septic condition. The mother and child often had the same disease, but sometimes its form and seat

> were, and at other times were not, the same in both; for example, a child sometimes died of peritonitis and its mother of purulent infection, or the child of purulent infection and the mother of peritonitis. . . . The infants of 50 women who recovered after having had puerperal symptoms died of peritonitis.

Peculiarities of Septic Infection as it Occurs in the Newly-born.

While the course of septic infection of older infants does not differ greatly in degree or in kind from that which is the rule in later life, sepsis neonatorum is of so peculiar a character that it requires special consideration. That the resistance of the newly-born organism is very low is shown both by the very rapid spread of the infective process by continuity and by the urgent danger of a generalised dissemination throughout the body. Generalisation of the infection very often takes place without visible involvement of the lymphatics (lymphangitis), and without enlargement of the lymphatic glands (lymphadenitis). It is a curious clinical fact that enlargement of the lymphatic glands with or without secondary suppuration is commonly encountered in very young infants only in the occipital glands secondary to infection of the skin of the scalp. Characteristic, too, is the predominance of toxic symptoms over the infective—coma, convulsions, muscular rigidity, diarrhœa, diffuse hæmorrhages. In the most severe and fulminating cases indeed, the infective symptoms are often completely obscured in this way, and neither the original site of infection nor the secondary metastases may be indicated by any visible reaction or subjective symptom. With alarming rapidity the picture changes to that of a severe and fatal disturbance of the general metabolism of the infant, marked by stupor, muscular twitchings or convulsions, a livid or cyanotic hue of the skin, circulatory weakness, dyspnœa, diarrhœa, rapid loss of weight, dehydration of the body, and inability to suck. Even fever may be absent, and in the rapidly ensuing terminal collapse subnormal temperatures are found as often as high fever. Rigors are always absent, perhaps because of the rarity of thrombotic processes, with the single but well-marked exception of urinary sepsis. Rigors may indeed be said to be pathognomonic of pyelonephritis. Enlargement of the spleen is seldom discernible, but jaundice is characteristically common. In the urine albumin and casts are usually found. At times we meet with a typical hæmorrhagic nephritis.

The skin often shows evidence of the severity of the toxæmia. Scarlatiniform and morbilliform rashes, and especially petechial hæmorrhages, are common. Sclerema, and especially a widespread septic œdema, is often encountered. Endocarditis is not to be recognised during life, but it is an occasional finding at the autopsy. Pericarditis and empyema are much more frequent and may sometimes be recognised in life. Peritonitis is, in general, a complication of umbilical infection or of erysipelas of the abdominal wall, less commonly it owes its origin to a generalised pyæmia. Finally, in addition to the toxic cerebral symptoms we find not infrequently evidence of meningitis or meningo-encephalitis occasionally purulent but more often serous, with much œdematous swelling of the pia mater, and with a serous or serosanguineous exudate. The cerebro-spinal fluid may then be blood-stained and characteristically shows a high protein content and a greatly increased number of cells. In this condition, too, retinal hæmorrhages have been found from time to time.

The disorders, which under the name of Buhl's disease and Winckel's disease, still figure in text-book descriptions of neonatal disorders, are in reality no more than particular manifestations of sepsis neonatorum of great severity occurring in the distant past, discussed by their authors with no great clarity. Buhl,[3] a morbid anatomist, was impressed with the frequency of fatty degeneration of the liver at autopsies he conducted upon infants who had died shortly after birth with symptoms such as icterus, cyanosis, and multiple hæmorrhages, and put forward the erroneous suggestion that death was due to a fatty degeneration of the liver, comparable to that produced by phosphorus poisoning. It does not appear that the livers of these infants exhibited a higher degree of fatty change than is common in many severe infective states. Winckel,[4] on the other hand, recounted a particular epidemic of a disorder which he described under the name cyanosis afebrilis icterica, in which many new-born infants died without pyrexia but with cyanosis, jaundice and, according to Winckel, hæmoglobinæmia. It does not appear, however, from a study of Winckel's original communication that either hæmoglobinæmia or hæmoglobinuria was in fact actually identified, and, indeed, he speaks of the presence of blood corpuscles in the urine without apparently appreciating the significance of the distinction. In subsequent cases attempts to identify hæmoglobinæmia have been unsuccessful. Sepsis neonatorum is a disorder apt to present itself in many forms and guises, but it is important to recognise the underlying identity of all.

The Peculiar Liability of the Newly-born to Infection.

The explanation of the increased susceptibility of the newly-born to septic infection is perhaps to be found in part in the structural peculiarities of the skin and mucous membranes in the first weeks of life, to be discussed later, which render them much more readily permeable to bacteria, but, in addition, it has been demonstrated that the blood of the newly-born is deficient in antibodies. In practice, we find this susceptibility to infection greatly increased by the abandonment of breast-feeding. It is invariably the experience that septic infection will occur in a far larger proportion of artificially-fed than of breast-fed infants, and that the mortality in the bottle-fed, because of their lesser powers of resistance, is very much higher. Even when dealing with the localised and specific infection of gonorrheal ophthalmia in the newly-born, it was my experience, when attending the Metropolitan Asylum Board's Hospital for this complaint, that recovery in the breast-fed was achieved, under conditions and with treatment otherwise identical, in about half the time taken by those artificially fed. The bactericidal power of the serum of the breast-fed infant has been shown to surpass greatly that of the artificially fed, whether because of the protection directly derived from the mother's milk or because under the natural food, the production of protective substances by the organism itself is stimulated. Circumstances which powerfully predispose to infection are prematurity, dyspeptic and nutritional disturbances of all sorts, and congenital syphilis.

Portals and Paths of Infection.

The part played by certain portals of entry, of great importance in later childhood—the tonsil and middle-ear for example—in the newly-born is relatively inconspicuous, while that of others—the umbilicus, for example, the skin and the different mucous membranes is prominent. The number of cases in which it remains impossible to determine the exact point of entrance, in life and even after a careful post-mortem examination, is very high.

The risk of septic infection is already incurred during intra-uterine life. Occasionally cases have been reported, in modern times, with complete bacteriological investigation, of infants coming into the world dead or dying of generalised septic infection. As a rule, the infection has taken place through the placenta from a mother herself, the subject of a septic disorder. When the mother has remained unaffected, we must suppose that in her the infection has remained controlled or suppressed, and only obtained a footing in the fœtus.

Occasionally the infection has its beginning in the course of labour as a result of the aspiration of infected amniotic fluid or from contamination by pathological vaginal secretions. But much more frequently infection takes place after the birth in the first few days of extra-uterine life. In a very high proportion of cases the umbilicus is infected. Often the umbilical wound is the primary source of infection, but close observation will also show that the infection of the umbilicus is often secondary to generalised infection. Indeed, no matter where the original seat of infection may be, it is usual to find that the umbilicus becomes secondarily involved. Rivalling the umbilical wound in importance as a portal of infection are all eczematous and intertriginous erosions of the skin, which lay bare the subepithelial lymphatic sinuses, all points of decubitus, especially on the occiput, the sacrum, and the heels; impetiginous infections of the skin, which in the newly-born characteristically take the forms known as pemphigus neonatorum and dermatitis exfoliativa; all ulcerative conditions of the mouth, especially the deep-seated ulcer of the palate known as Bednar's aphtha, and all streptococcal infections of the mucous membranes—nasal, pharyngeal, conjunctival, or bronchial.

In pædiatric literature the part played by the intestinal mucous membrane as the portal of entry has been the subject of much debate. According to Czerny and his school, much of the total of sepsis neonatorum originates from the bowel. In general, however, opinion inclines to the view that the frequent intestinal symptoms, with profuse and sometimes foul-smelling diarrhœa, are secondary results of the infection.

In a proportion of the cases, as a result of a local ulcer or abscess of the skin or subcutaneous tissue, because of the low resistance, the inflammatory process extends rapidly, to form a widely spread infiltration, to open neighbouring joints, or to cause gangrene of the skin, of a finger, or of the ear. The rapidity of such a spread may be truly astounding. In a few hours a tiny spot may have become a widely-distributed inflammation. Often the spread is along the fascial layers, the so-called progressive septic necrosis of the subcutaneous cellular tissues. Almost without swelling or œdema, but with a dusky discoloration of the skin, the necrosis advances. Incision reveals no pus, but in the end extensive sequestra and exfoliated masses of necrotic subcutaneous tissue may be extruded, leaving undermined the bluish discoloured skin.

It is perhaps more important to realise that generalised septic infection in the newly-born may spread from streptococcal infection of mucous membranes, without visible ulceration, but with much mucopurulent discharge. I may quote in illustration of this a case which recently came under my notice:—

> Twin boys, born at full time and in every way strong and vigorous, were circumcised on the eighth day of life. Unfortunately, although it was not known at the time, an outbreak of severe influenza had just begun at the nursing home in which the mother and the infants lay. On the evening of the day on which the boys had been circumcised, the mother's temperature rose to 104° F. On the following day two nurses in attendance had also been attacked. On the third day after circumcision the infants' temperatures rose to 105°. On the seventh day the circumcision wounds of both had become infected, discharging pus freely, and surrounded by a considerable area of redness and œdema. On the eighth day one infant died in convulsions. The second survived for eight more days, during which time a typical condition of trismus neonatorum developed. From the morning after the first rise of temperature, and before anything amiss with the circumcision wounds was apparent, there had been in both infants profuse rhinitis, with a copious discharge of thick muco-pus.

CLINICAL VARIETIES OF SEPSIS NEONATORUM.

In individual cases and, in particular, epidemics of the generalised infection of sepsis neonatorum, as might be expected, the clinical picture is very various, so that, as in the comparable case of influenza, it has been the custom to attempt a description of several types of the disorder, differing according to the system which happens to bear the brunt of the attack. We speak of a pulmonary form, with early and severe involvement of the lungs in a bronchopneumonic infection, in which lividity or cyanosis, dyspnœa and cardiac failure are the most prominent symptoms. Often there is a peculiarly intense rhinitis, with an acrid and irritating nasal discharge, causing ulceration of the nostrils and upper lip. Or, again, we may describe a gastro-intestinal form in which severe diarrhœa, with watery, green, and foul-smelling stools, and with a very rapid dehydration of the body, is the most prominent symptom, sometimes even the meconium may have a peculiar and characteristic odour. Or, again, it may be that the preponderating symptoms are referred to the cerebro-spinal system or are visible in a widespread cutaneous involvement. It is with these two last types alone, the cerebro-spinal and the cutaneous, that I propose to deal especially.

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SOME PROBLEMS OF THE NORMAL AND PATHOLOGICAL PHYSIOLOGY OF THE STOMACH.

BY VICTOR J. KINSELLA, M.B., CH.M. SYDNEY.

WITH ILLUSTRATIVE PLATE.

The Nervous Paths of Painful Stimuli.

AN excellent account of the nervous connexions of the gastro-intestinal tract is to be found in the paper published in 1920 by the late Prof. Hunter.[1] The vagus and the sympathetic are the two systems concerned and each of these includes both afferent and efferent fibres with their nerve centres in the medulla and spinal cord respectively. By means of these reflex systems gastric tonus, movement, and secretion are regulated according to the stage of digestion and the requirements of the food mass in the stomach. The extrinsic connexions play their part in the control of digestion, although the stomach and intestine have a certain measure of autonomy. It follows that there are two possible afferent paths which may be taken by painful impressions from the stomach. The first passes up the vagus to its dorsal nucleus beneath the floor of the fourth ventricle; the other passes along the sympathetic fibres to the solar plexus, then along the splanchnic nerves, through the sympathetic trunk and the white rami communicantes, then through the posterior routes of the spinal nerves to cells in the posterior horn of grey matter in the thoracic region of the cord.

By which route do the pain sensations reach the central nervous system? There are very few definite observations which help us to answer this question. Animal experiments have been chiefly concerned with the influence of the extrinsic nerves on the motor and secretory functions of the stomach. Surgeons have divided the nerves in man but have not given us an answer to our problem. In many cases both sets of fibres have been divided; relief is obtained in one case by a certain operation which fails in another case apparently similar; then, again, the conditions chiefly dealt with have been the gastric crises of tabes and the gastric neuroses, in the former of which the site of the painful stimulation is probably not in the stomach but in the nervous system, and in the latter it is not clear where the pain originates.

Hilton [2] in 1860, Martyn [3] in 1864, Lange in 1875 (quoted by Hurst [4]), and Ross [5] in 1888, recognised in their studies of referred pain the part played by the sympathetic system. But the vagus was looked upon as the chief sensory nerve of the stomach, and Ewald[6] in 1892 stated that "all conscious sensations," including pain, pass through the vagus. In recent years, however, Mackenzie's influence has swung the pendulum of opinion in the other direction, and the sympathetic has been credited with the chief, if not the only part in conveying the painful impressions from the viscera.[1 7 8 9] According to Preiss (quoted by Alvarez [10]) the vagi carry no pain fibres.

Probably both sets of fibres bear painful impulses. The sympathetic system and the spinal cord are the only direct nervous connexion between the viscera on the one hand and the skin and muscles of the abdominal wall on the other, so they probably subserve the hyperalgesia of the skin and muscles which is found in many cases. The part played by the vagus is proved, I believe, by a patient with a spinal cord lesion whom I saw recently.

The patient was a West Australian youth, aged 20, who, two years before, had met with a motor-cycle accident and had sustained a fracture of the spine at the level of the third thoracic vertebra with compression of the spinal cord. He had complete paralysis and anæsthesia below the level of a line just above the nipples, with priapism and other typical reflex disturbances. The skin was smooth, shiny, and atrophic, and the toes were markedly atrophic. He had a healing bed-sore over the sacrum. His general health was very good and he was comfortable and cheerful. A cystostomy had been performed in Western Australia. The bowels were opened every third day by an enema administered by his mother, probably at too great a pressure. The patient volunteered the information that the bowel movements were always accompanied by colicky pains referred to the abdomen.

The great interest of this case lies firstly in the fact that the painful stimuli could have been conveyed only by the vagus. It cannot be postulated that the painful impressions passed up the intact sympathetic trunk, and reached the spinal cord cranial to the lesion, because the principles of reflex symptoms which have been soundly based on anatomical and clinical data show that the pain is referred to the body segments at the level of the sympathetic connexion with the cord. In this case, therefore, if the sympathetic conducted the impulses the pain would have been referred not to the abdomen but to the upper thoracic and lower cervical segments. This case, moreover, demonstrates beyond doubt the visceral component in abdominal pain, because the parietal tissues were no longer in nervous association with the sensorium, and so there could be no "referred" element. Visceral pain need not therefore depend upon an overflow from visceral to somatic nerve cells.

Further evidence of the part played by the vagus is the headache experienced by some patients with disease of the gall-bladder or with chronic duodenal ileus. Many writers attribute the headaches to a toxic origin, but many of the patients enjoy very good general health, and some normal people (including myself) experience frontal headache after drinking very cold water, so perhaps the cause is reflex rather than toxic.

I think we can safely conclude that neither the vagus nor the sympathetic nerves monopolise the painful stimuli, but that each has its share. The sympathetic nerves certainly subserve the cutaneous and muscular hyperalgesia, and also the more superficial or the referred component of visceral pain. The vagus probably subserves the deep or truly visceral element together with the deep tenderness localised to the lesion itself. Individual differences in the nervous make-up of the individual appear to alter the clinical picture. In women the sympathetic element is more noticeable; the symptoms are diffuse and tenderness can be elicited by pressure which is not necessarily over the lesion, and which scarcely disturbs the viscera beneath. In patients of a more phlegmatic type, generally the male, the sympathetic element is less noticeable, there may be no apparent tenderness until deep firm pressure is made exactly over the lesion, and in these cases it sometimes happens that one fails in the search for a deep, tender point until the examination is made under the fluoroscopic screen, and then it is found that pain results only when the affected part —e.g., the pylorus—is actually compressed against the posterior abdominal wall; but when the viscus slips from beneath the fingers the tender point cannot be demonstrated until the organ is again pinned down. In many patients both types of tenderness can be recognised, the superficial (or sympathetic) and the deep (or vagal).

The deep tenderness localised to the lesion itself is in the case of the stomach very often placed caudally to the area of superficial tenderness which is often confined to a triangular area of parietes above the lesser curvature of the stomach and bounded on either side by the rib margins. The lesion—e.g., an ulcer of the pylorus or duodenum—may lie in Bolton's lower or middle sterno-umbilical region,[11] and the referred symptoms in the middle and upper zones (Fig. 1). Although one associates this more superficial pain, cranial to the level of the stomach, with an irritable focus in the spinal cord, the dependence of this pain and of the irritable focus in the cord upon the lesion itself must not be forgotten. This dependence of the more cranial hyperalgesia upon the lesion may easily be overlooked because the pain provoked by pressing over the lesion is nearly always referred to the area pressed upon, and not to the more cranial hyperalgesic area. But I have seen at least one patient with ulcer who indicated the upper zone and placed a leaden numeral upon it when asked to point out the site of pain provoked by pressure over the lesion lower down.

FIG. 1.

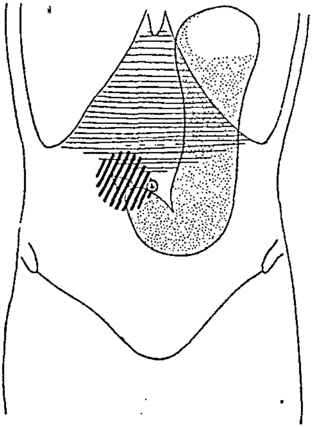


Diagram showing the distribution of tenderness often found in patients of orthosthenic or hyposthenic type with a pyloric or duodenal lesion. The referred or sympathetic tenderness is superficial and shaded lightly. The vagal or deep tenderness is shaded heavily. The more caudal position of the latter is a clinical suggestion of the slipping of the human stomach below its associated somatic segments.

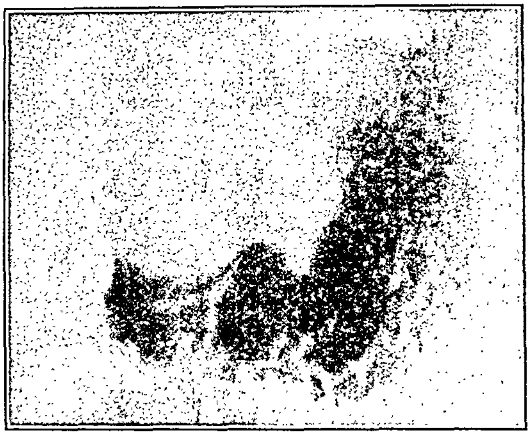
The above conception of two clinical varieties of pain subserved by different nervous mechanisms might well be tested by the surgeon who attempts neurotomy for the relief of gastric pain, and it may prove useful in indicating the nervous connexions which must be severed in any particular case. Perhaps, also, it explains some of the individual failures which have followed different methods of neurotomy.

Man's Upright Posture.

The referred pain, hyperalgesia, and muscle guarding in the upper and middle sterno-umbilical regions are looked upon biologically as reflexes having the function of protecting and resting a diseased viscus. This view is borne out by the observation that these viscerosensory and visceromotor signs are found in the presence of an inflammatory lesion, but, unless the agony is very great, they are usually absent when pain depends upon colic; in fact, the patient suffering from colic often finds some measure of relief in doubling up and pressing upon the affected part.

mucosa show, with the patient in the horizontal position, that the empty stomach is not always tubular but often a broad flattened viscus with the anterior and posterior walls in apposition, free to accommodate an increase in contents by mere separation of its walls and by making use of its potential cavity without altering the postural length of the muscle-fibres. Larger variations in the volume of contents will, of course, bring into play the tonic properties of the muscle. If the stomach is now well filled, until the patient feels full, and is again palpated, it will be found that the anterior and posterior walls can be easily pressed together again and the fluid contents displaced without the examiner experiencing any of that familiar feeling of tension in fluid-filled cavities. The stomach feels to be, and is seen to be, a bag which is not filled to its utmost capacity. If the stomach were to relax just enough to accommodate its contents and no more, we would expect to feel the fluid resistance of a well-filled bag because it is found that a latent period of some seconds elapses before the stomach accommodates its tone to its contents; in other words, one would expect an impression of tension. But in the fluoroscopic examination, and even in the radiograms (see Figs. 2 and 3), the peculiar impression of softness or relaxation is quite a distinct characteristic of the orthotonic stomach and appears to be altogether incompatible with a rise of tension either in the wall or in the lumen of the viscus.

FIG. 3.



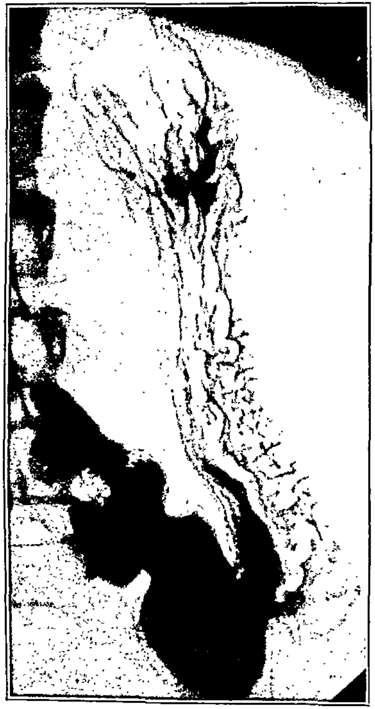
A short orthotonic stomach, almost empty.

The appearance of stomachs akin to that illustrated in Figs. 2 and 3 was so different from the conventional description that I suspected for a time that it was due to an artefact, and that the walls of the stomach were held apart by the water in which the barium had been given, while the powder itself (although finely "fluffed"), had sedimented in the lowest part of the stomach. But by keeping a sample of the barium suspension in a glass tumbler it was found that sedimentation would not explain the appearance, which could be detected before sedimentation occurred in the tumbler. Suspension was aided by a little tragacanth in the case of Fig. 3, and this patient was of the sthenic type. When the vehicle of the meal is thicker still—e.g., bread-and-milk—the food remnants are found to lie in the pylorus when the stomach has nearly emptied itself, but the rest of the stomach cannot be visualised because the thicker chyme does not adhere in the mucosal folds. Radiography of the stomach, after very small fluid meals (2–3 oz.), therefore suggests a slight modification in Sherrington's teachings, at least in some cases, and at least in dealing with the empty or part-filled stomach. It appears that this organ very often accommodates two ounces of fluid, not by a two-ounce posture, but by a four-ounce posture, so that the contents are not always accurately grasped, but often leave a potential cavity and fail to fill the stomach as high as the cardia. The walls of the stomach above the contents of the pylorus are apparently kept pressed together by the neighbouring viscera and by intra-abdominal pressure. The postural lengthening of the gastric muscle is not required, and there is, as a rule, no sense of fullness until this potential space has been filled to the cardia. Here, then, we have the explanation of the thirsty person's capabilities. Individuals with the small stomach (e.g., my friend Dr. Apperly) cannot perform these feats. Their difficulty has been assumed to depend upon a slowness in the postural lengthening of their gastric musculature. But this explanation is not very satisfactory, for the musculature is seen radiographically to be particularly active and efficient. A more likely explanation of the early fullness is the small potential space available. It must be stressed that we are speaking only of the orthotonic stomach and that the described behaviour cannot be satisfactorily demonstrated in all cases, especially when the abdomen is hard and tense, or when the barium is administered in a thick medium such as bread-and-milk. Under these circumstances the meal will pass downwards from the œsophagus much more slowly and will pass back into the vertical part only with difficulty. The difference is probably due in the first case to the more firm apposition of the stomach walls caused by the greater intra-abdominal pressure, and in the other to the more glutinous quantity of the meal which slides down with difficulty between the apposed walls.

When the opaque meal enters the stomach it is held up for a variable time by the stomach wall, except in hyposthenic individuals, and only gradually finds its way to the pylorus. This so-called "peristole" is often said to be a manifestation of muscular tone, but this point of view needs some qualification. It must be remembered that the food makes its way down an inclined plane which passes downwards and forwards from the cardia to the lowest point of the greater curvature. This inclined plane is probably partly responsible for the "peristole," and if we tilt our screening table so that the plane becomes more inclined, we find that the hold-up of the food becomes more marked, and before the horizontal position is reached the meal collects at the fundus of the stomach as it is swallowed. As the food passes down this inclined plane its progress is mechanically hindered by the apposition of the stomach walls which depends in part, at least, upon the intra-abdominal pressure and the pressure from neighbouring viscera. As the food descends it must separate the stomach walls against these opposing forces. The slowness of descent is in direct proportion to the thickness of the meal. The tubular shape of the vertical limb of the stomach, very often seen with the patient in the vertical position, can be modified by the horizontal position, so that the viscus becomes more flattened and the "tube" two or three times broader. These observations suggest that mechanical factors play a considerable part in producing "peristole."

In the supine position the well-filled orthotonic stomach becomes broader at the cardiac than at the pyloric end, while in the upright position the pyloric end becomes as broad as, or broader, than the cardiac. The degree of tension in the normal stomach wall is therefore not sufficient to prevent alterations in the shape of the viscus by the slight change in fluid pressure brought about by changes in posture. Moreover, the stomach empties more rapidly when the patient lies on the right side and less rapidly when on the left side. The duodenal cap is best filled when the subject lies prone, and use is made of this fact in routine radiography. The influence of gravity in changing the shape and emptying of the stomach is further illustration of the absence of tension or of resistance in the stomach wall, and of the fact that

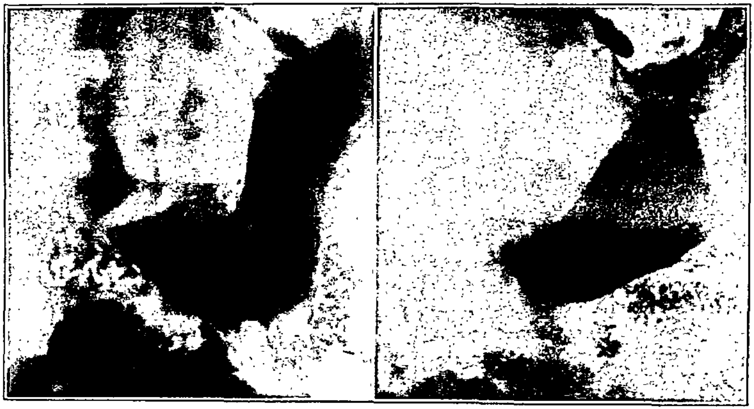
Fig. 2.



A long orthotonic stomach, almost empty.

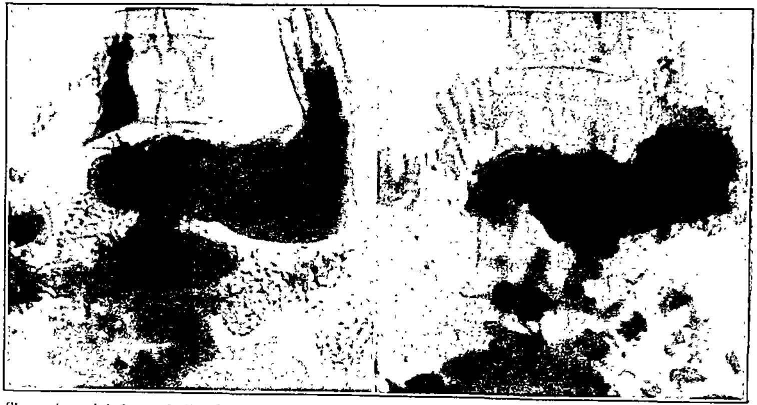
DR. VICTOR KINSELLA:

PHYSIOLOGY OF THE STOMACH.



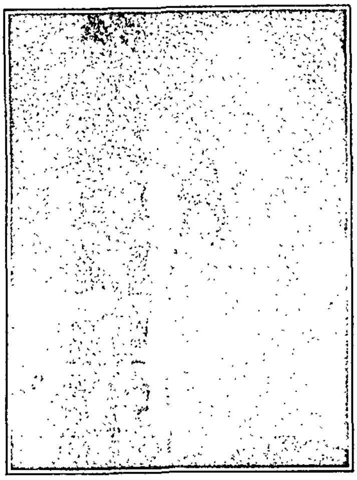
Shows a stomach before and after injection of 100 c.cm. of 0·6 per cent. hydrochloric acid. After the acid, note the pyloro-spasm, and the reduction in quantity of the jejunal contents.

Fig. 5.



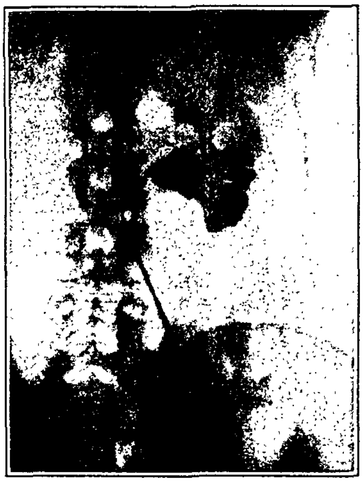
Shows stomach before and after the injection of 0·6 per cent. hydrochloric acid. After the acid, note the spasm and shortening of the whole duodenum and the peculiar appearance of the jejunal contents probably indicating spasm in the jejunum.

Fig. 1.



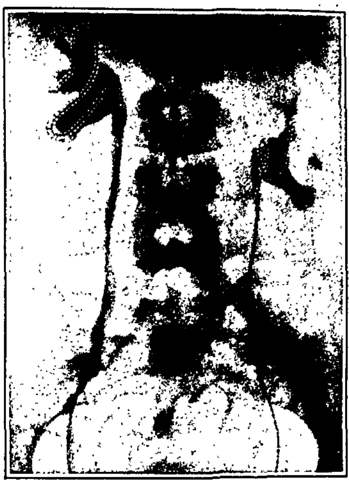
Normal pelvis.

Fig. 2.



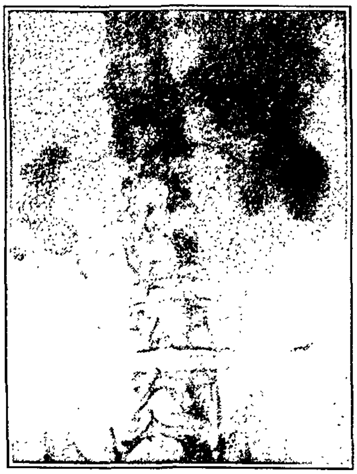
Dilatation in a movable kidney.

Fig. 3.



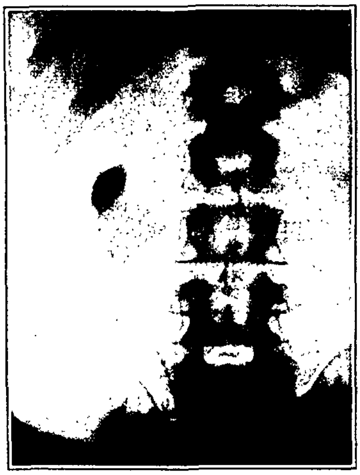
Inflammatory dilatation on right side. (Left of picture.) Normal pelvis left side. Note curling up of catheters.

Fig. 4.



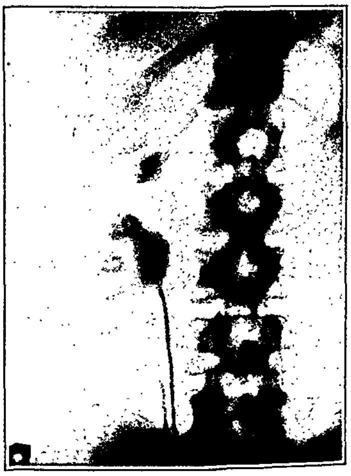
Three stones in moderately dilated right kidney. (Left of picture.) Very large left hydronephrosis.

Fig. 5.



Oxalate stone in upper calyx of a horse-shoe kidney.

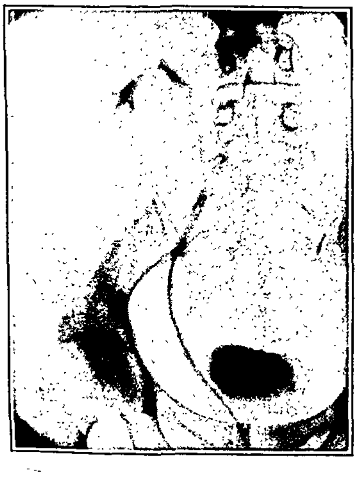
Fig. 6.



Double renal pelvis, two ureters each containing a catheter.

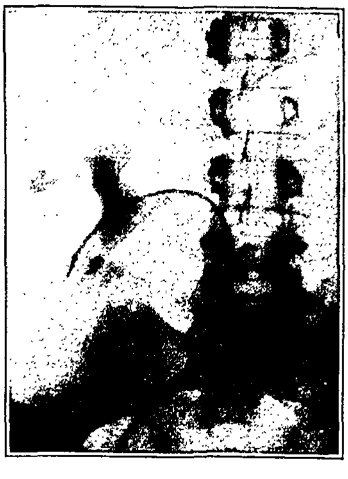
In Fig. 4 note transverse trickle of fluid opposite bottom of third lumbar vertebra indicating lower limit of hydronephrosis.

Fig. 7.



growth in upper pole. Only
calyx remains. Kidney dis-
by overlying neoplasm.

Fig. 8.



Congenital cystic disease. Pelvis depressed by cysts in upper pole.

CLINICAL INTERPRETATION OF AIDS TO DIAGNOSIS.

MR. J. B. MACALPINE: PYELOGRAPHY.

merely mechanical as well as physiological factors are of importance.

It is often seen, as in Fig. 2, that the tension of the stomach wall is not sufficient to support a column of watery fluid in the vertical limb of the stomach. Different observers have investigated intragastric tension in man; Kelling (quoted by Sherrington) found that *it tended to remain at 8 cm. of water.* A feeling of fullness is produced when the tension reaches 10–22 cm. of water (Apperly [17]), 12–14 mm. of mercury (Hurst [4]). But probably these experiments do not reveal the degree of tension in the gastric wall, because the pressure within the stomach depends not only upon the tension of its walls but also upon the intra-abdominal pressure, so that to arrive at the tension in the stomach wall we must subtract from the above figures the intra-abdominal pressure. When the stomach is experimentally distended it is found that only very small rises of intragastric pressure can be brought about. In Kelling's experiments the pressure was 10 c.cm. of water after injecting 500 c.cm. of air and water, and this pressure then fell to 8 c.cm., at which it remained. The *injection had produced, therefore, a rise of but* 2 c.cm. of water above the normal intragastric pressure. Hurst injected air into the stomach until a sensation of fullness was produced and the pressure rose only 2 mm. of mercury. Apperly rapidly injected air into the stomachs of eight healthy students and found that a sensation of fullness was produced approximately after 30 seconds (personal communication), when he had injected 250–1200 c.cm. of air and the pressure had reached from 10–22 c.cm. of water. In an endeavour to produce pain by distending my own stomach with Apperly's apparatus I found that fullness was produced after 30 seconds, and 10 seconds later nausea and retching, which terminated the experiment. By this time 425 c.cm. of air had been injected. These experiments illustrate *that even when extreme means are used only small* rises of intragastric pressure results, and that when these rises are brought about the subjective sensations produced are fullness and later nausea. The occasional production of pain by extreme distension has been referred to in a previous communication.

In view of the above outlined experimental and radiographic observations on gastric tone and the potential gastric space, it seems very unlikely that muscle tension in the wall or lumen of the stomach should be the cause of pain in the natural course of disease, unless it be found that the diseased stomach differs from the normal stomach in its motor behaviour, and that the stomach in pain differs from the pain-free stomach. I have previously reviewed the evidence that there is no such difference and have *now only to add the testimony of Ortmayer* [18] *and* Palmer.[19] There is no evidence in these cases that gastric tonus has failed in its functions of preventing tension. Dr. S. F. McDonald, of Brisbane, has drawn my attention to congenital hypertrophic stenosis of the pylorus, in which painless peristaltic waves visible through the abdominal wall can be seen advancing against the stenosed pylorus. If any condition could produce the requisite alterations in tension it is this, and yet the child may lie quite placidly while these waves are observed. To those *who adhere to the hypothesis of "muscle-pain,"* there remains only the possibility suggested by Bolton that the "fine changes in muscle-tension responsible for the pain cannot be appreciated by our methods." But it is difficult to understand how painful stimuli could be transferred to the adjacent nervous elements by changes in the muscle-fibre so fine as to cause no visible disturbance in the filling, size, shape, or emptying of the viscus. If it is through the exposure of nerve-fibres in the ulcer, with consequent abnormal irritability, why does the *acute ulcer cause no pain? Why is not the tension,* and with it the pain, modified by every peristaltic wave? It cannot be that the waves succeed each other so rapidly than a continuous sensation is produced, for no such peristaltic behaviour is a necessary accompaniment of the pain; moreover, gastric sensations which are known to depend on peristalsis—viz., hunger pangs—are intermittent (Carlson), and therefore unlike ulcer pains.

To summarise, there is little or no evidence that uncomplicated peptic ulcer causes disturbance of muscular tension, nor is there much evidence that *such disturbance, even if present, would cause pain.*

The Part Played by Acid.

That acid is the normal stimulus of the pain in peptic ulcer has been doubted ever since Hurst reported in 1911 *that he had injected large quantities* of acid into ulcerated stomachs without causing pain. But Palmer [19] has recently revived the hypothesis and has succeeded in producing pain in 84 out of 100 patients by pouring acid into their stomachs, but he failed in the case of 25 patients. Even in the first group, 80 of the 404 experiments failed. It is apparent from the work of these and of many other investigators that acid sometimes causes pain when brought into contact with an unhealed ulcer, and sometimes it does not. Palmer has pointed out that at times the active ulcer is insensitive to the normal stimulus—i.e., the patient has a remission of his symptoms—and during these periods the ulcer is more likely to be insensitive to the artificial stimulus as well. These observations, and many others summarised by Alvarez, *make it clear that the acid* is not the direct cause of the pain. Other objections to the acid theory suggest themselves. Recently a patient under our care with a penetrating ulcer, proved later at operation to be adherent to the pancreas, suffered from steady pain throughout a test-meal, the free acidity rising from 0 to 50, and falling again to 2. Palmer reports three cases of ulcer pain with no free acid at the time of pain. One ulcer was simple, another syphilitic, and a third carcinomatous. In another of his patients we find *no pain, with a free acidity of 33; 45 minutes later* severe pain, with an acidity of 35, and 20 minutes later no pain, with an acidity of 43. Fenwick, quoted by Hardy [20] says that it is common in long-standing hyperchlorhydria for the free HCl to fall gradually until subacidity is obtained, while the painful sensations increase rather than diminish. It is of importance also to remember that treatment, whether medical or surgical, may relieve symptoms and yet cause no decrease but even an increase in the acid curve (Hardy,[20] Crohn and Reiss,[21] Sherren [22]). How can the acid hypothesis explain the absence of pain in acute ulcers? How can it explain the pain in lesions with no breach in the gastric mucosa? How can it explain those cases in which food and alkalis gradually lose their power of relieving the pain?

A further objection to an acceptance of the acid hypothesis is the extreme measures which have been required to produce the pain in the experimental studies; 200 c.cm. of 0·5 per cent. HCl is administered, and if the pain is not produced this dose is repeated at half-hourly intervals.[19]

It is believed that a high degree of gastric acidity will "intensify and prolong the duodenal reflex contraction of the pylorus, as well as induce strong contractions in the duodenum itself" (Carlson,[23] Reynolds and McClure[24]). Palmer, however, found that the acid "produced slightly more spasm of the duodenum than did the neutral solution, but the difference was relatively small."

In order to investigate the effect of a high acidity on the motor functions of the stomach, I made a careful fluoroscopic examination before and after acid in 15 subjects who kindly consented to the experiment. The subject first swallowed an Einhorn tube, and in most cases the tip of this was made to lie just within the cardiac orifice. About *50–100 c.cm. of aqueous barium* suspension was then swallowed, and the stomach movements were observed for 5 to 15 minutes, and then 100–200 c.cm. of 0·6 per cent. HCl, sometimes with some barium in suspension, was injected down the tube and its effects observed for 30 to 40 minutes. The fluid already in the stomach would dilute this acid. In one case no visible effect was produced by the acid. In the other 14 cases, after an interval of two to five minutes, peristalsis ceased and spasm was observed at the pyloric end of the stomach (Fig. 4). This disturbance lasted for only a few minutes in some cases, in others it lasted for more than half an hour. The spasm varied in degree. In four subjects a powerful contraction obliterated the duodenum, the pylorus, and the pyloric antrum, so that barium could not be forced out of the stomach by palpation; in one the pylorus became spigot-shaped; in one case a J-shaped stomach became "steer-horn"; in the rest the spasm was less striking because only the immediate region of the sphincter and duodenum was involved, the barium could not easily be forced through the pylorus and the stomach emptied less rapidly, and it was found that the duodenum and uppermost coils of jejunum, previously well filled with barium, were now no longer visualised because they were no longer kept well filled by the stomach. In most cases the barium which had already left the stomach lost the feathery appearance typical of the jejunal coils and became aggregated into solid little masses, as though squeezed by powerful tetanic spasms of the intestine (Fig. 5). These findings agree with the clinical observations of prompt relief produced by acid in the gastrogenous diarrhœa of achylia.

These varying motor effects possibly suggest an explanation of the varying clinical effects produced by acid in ulcer patients. The different degrees and kinds of pain suggest that acid does not act as a direct irritant. At times the agony is so severe that the patient groans, perspires, and rolls upon the floor. In these cases it is probable that a sensitive ulcer has come within the grasp of a powerful spasm like that illustrated in Fig. 4. Intermediate degrees of pain probably depend upon intermediate degrees of sensitivity in the ulcer, and upon intermediate degrees of motor disturbance. The failure of the acid to produce pain will depend upon an absence of sensitivity in the ulcer at the time of the experiment, or upon an absence or minor degree of motor disturbance caused by the acid. Palmer found that the pain was produced without any relation to pylorospasm or other disturbance, but I believe it possible that he has overlooked the minor degrees of localised spasm in which the chief clue to the spasm is the absence of barium in the upper coils of small intestine. In Fig. 9 of his paper is the radiogram of such a case. The appearance suggests that in the distal part of the duodenal cap there is a spasm which has foreshortened the cap by about half its normal length, and has prevented the filling of the jejunal coils. The spasm may last only for a few minutes, but after it has disappeared the ulcer may still remain painful. Palmer found that the pain would sometimes not disappear for 30 or 40 minutes after the stomach was emptied or the acid neutralised.

Palmer's work clearly shows that the sensitivity of the ulcer will largely determine the effect produced by acid, and I believe that the sensitivity of the ulcer depends largely upon alterations in the circulation which are caused either by fluctuations in the inflammatory process or else by ever-changing circulatory phases in the digestive and interdigestive cycles

Conclusions.

In attempting to explain pain in disease of the abdominal viscera Mackenzie has stressed an irritable focus in the spinal cord; Lennander and Morley have dealt with the parietal peritoneum and the mesentery; Hurst and Ryle have suggested functional alterations in the tension of the visceral muscle. The kymographic school have suggested powerful peristalsis; Sippy and Palmer have directed their attention to the acidity of the gastric contents. It is, indeed, remarkable that all possible parts surrounding the disease have been fully considered, while the tissue actually diseased has been comparatively neglected.

All the hypotheses advanced to explain peptic ulcer pain have their shortcomings, and in many instances their supporters point these out and express the belief that there must be some other factor. This factor, the missing piece, in fact the main piece, in the jig-saw puzzle, is the diseased tissue itself. If its importance is recognised, the parts played by other factors will fall easily and naturally into their proper places. The inflammatory reaction and rise in tissue tension in the affected part is the cause of Mackenzie's irritable focus in the spinal cord; pylorospasm and powerful peristalsis, while not usually painful themselves, may cause pain by squeezing inflamed and sensitive tissues and so producing the colicky type of pain occasionally met with in peptic ulcer; excessive acidity cannot of itself cause pain except by increasing the tonic grasp of the gastro-duodenal musculature upon a sensitive ulcer.

The observations recorded in this paper have resulted from the routine investigation of patients in Mr. Devine's clinic, and it is with pleasure that I acknowledge my indebtedness to Mr. Devine. My thanks are due also to the many friends, including Dr. F. L. Apperly and Dr. J. G. Hayden, who "lent me their stomachs" (as Dr. Apperly puts it), for some of the work which was more experimental than clinical.

Summary.

1. A case is reported of purely visceral pain subserved by the vagus nerve, the patient having a complete transverse lesion of the spinal cord in the upper thoracic region.

2. It is pointed out that two components of abdominal pain can be distinguished clinically, that their relative importance differs in different subjects, and that they are probably subserved by different nervous connexions, the truly visceral pain by the vagus, and the referred pain by the sympathetic. This conception may be of help in the operation of neurotomy for gastric pain.

3. Man's upright posture has modified the position of his stomach in relation to its associated somatic segments and to its reflex symptoms. This may have some bearing upon certain types of gastric neuroses.

4. Biological considerations suggest that the tissue reactions against disease are the adequate stimuli for pain. These reactions are inflammatory infiltration and powerful peristalsis. Clinical and experimental data support this conclusion.

5. A radiographic study of the stomach by a special method suggests a modification of the conventional idea of the empty stomach as a narrow tube with its walls kept in firm apposition by muscular tone. A potential gastric space often exists and enables the stomach to accommodate a certain amount of contents, differing in different subjects, before a postural lengthening of muscle fibres is required.

6. Radiographic study confirms the experiments of the physiologists who found that postural tone prevented alterations in the tension of the hollow viscera.

7. Hydrochloric acid caused marked motor disturbance of the stomach, duodenum, and jejunum in the majority of 15 subjects. The significance of (5) (6) and (7) in regard to pain is discussed.

8. The diseased tissue itself as a direct cause of pain has been largely overlooked. A recognition of its importance will clear up many difficulties in explaining abdominal pain.

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TREATMENT OF MALARIA WITH DIMEPLASMIN.

By RICHARD GREEN, M.B., B.S.,

ACTING MALARIA RESEARCH OFFICER, INSTITUTE FOR MEDICAL RESEARCH, KUALA LUMPUR, FEDERATED MALAY STATES.

THE new drug named dimeplasmin represents an endeavour by the manufacturers of plasmoquine to produce a further synthetic remedy, of the so-called plasmin group, which would be as effective as plasmoquine for malaria, but would be less toxic. The Havero Trading Co., who are the Calcutta agents for the I.G. Färbenindustrie, requested the Institute for Medical Research, Kuala Lumpur, to investigate the therapeutic value of dimeplasmin in malaria as, although the drug had been found effective in destroying the plasmodia of bird malaria, its value in human cases had not been determined. We were therefore supplied with a quantity of this new drug together with (unpublished) details of preliminary animal and bird experiments made with dimeplasmin by Dr. Roehl and Dr. Eicholtz at Elberfeld.

Dimeplasmin was received in the form of white tablets which had a somewhat bitter taste. The weight of each tablet was approximately 0·4 g., and it was said to consist of dimeplasmin as a base combined with a "high molecular organic acid," so that 0·5 g. of the salt contained 0·2 g. of dimeplasmin base. It is to be noted that this drug is in the experimental stage and is not for sale.

It was found at Elberfeld that dimeplasmin base compared favourably with plasmoquine hydrochloride in its destructive action on the plasmodia of bird malaria. A wide range of dosage was employed, commencing with the quantity just sufficient to destroy the parasites and ending with the largest dose tolerable. With plasmoquine hydrochloride the effective dosage varied between 1 and 33 units. A similarly wide plasmodicidal range of between 1 and 30 units was obtained with dimeplasmin base.

Animal Experiments with Dimeplasmin.

Eicholtz estimated the limits of tolerance of dimeplasmin by giving the drug to animals by various routes. In addition a comparative study of plasmoquine hydrochloride was made at the same time.

He found that dogs could tolerate by mouth up to 200 mg. per kg. body-weight of dimeplasmin base, but that larger doses gave rise to toxic symptoms. Plasmoquine hydrochloride by mouth in doses exceeding 20 mg. per kg. body-weight produced symptoms of poisoning.

Injections of 100 mg. per kg. body-weight of dimeplasmin base given subcutaneously to cats did not produce methæmoglobinæmia, whereas plasmoquine hydrochloride in similarly injected doses of 2 mg. per kg. body-weight did so, and 5 mg. brought about lethal blood changes. Dimeplasmin base given intravenously to cats produced a slight depression of blood pressure, but plasmoquine hydrochloride similarly given definitely lowered the blood pressure and affected the rhythm of the heart.

On these experiments the manufacturers were able to state that: 1. Dimeplasmin has a destructive effect on the plasmodia of bird malaria and in this respect compares favourably with plasmoquine. 2. It is therapeutically active in birds within wide limits. 3. It is less toxic than plasmoquine and does not produce methæmoglobinæmia.

It remained, therefore, to ascertain its dosage and therapeutic effects in human cases of malaria.

Malaria Cases Treated with Dimeplasmin.

The drug was given at Kuala Lumpur to 11 malaria cases. Five of these had subtertian, four had benign tertian, one had quartan malaria, and the other a mixed infection with *Plasmodium vivax* and *P. falciparum*. All these patients were male Tamils; their ages ranged between 18 and 30 with an average of 22·6 years. The lowest body-weight was 81 lb. and the highest 113 lb.; average 95·4 lb. (43 kg.).

The patients were under our observation twice daily when the drug was given, precautions being taken to see that each dose was actually swallowed. Temperature and pulse-rates were recorded four times each day. The urine was examined daily for albumin and for the presence of quinine which might have been given by mistake in hospital, but this precaution was useless, as a white cloud formed when Mayer's reagent was added to the urine of patients taking dimeplasmin, similar to that observed in cases taking quinine.

Thin and thick films from each patient were examined daily for malaria parasites, the number of parasites in all stages per 100 leucocytes in the thick films being recorded from day to day. Spleen measurements, blood pressure readings, and hæmoglobin percentages were estimated every second day.

The makers suggest that a commencing oral dose of 0·4 g. dimeplasmin base per day be given to adults. In a person weighing 100 lb. (45·3 kg.) this would represent 8·8 mg. per kg. body-weight per diem. The agents state that up to ten tablets a day may be given with safety. Our tablets weighed 0·4 g. each, and, as it was specified that 0·5 g. of dimeplasmin contained 0·2 g. of dimeplasmin base, the administration of ten tablets a day to a person weighing 100 lb. would represent a dose of 35·2 mg. of the base per kg. body-weight per diem.

In our series the dosage of dimeplasmin base varied from an initial daily dose of 0·2 mg. to 12·9 mg. per kg. body-weight, rising each day to a final and fixed dose on the fifth day and thereafter of 25·1 to 34·6 mg. per kg. body-weight per diem.

Results of Treatment.

As will be seen from the Tables here given the administration of dimeplasmin in the dose specified did not destroy the parasites or materially affect the course of the malarial symptoms.

James [1] says: "In the great majority of cases of uncomplicated malaria the general course is towards recovery." In estimating the effect of any new drug on cases of malaria an acquaintance with the course of untreated malaria (as fully described by James) would thus appear to be almost essential, otherwise the diminution in the number of parasites and cessation of fever—if these occur as part of a naturally acquired immunity—may be ascribed to the effects of the drug. From the histories given in our series of cases treated with dimeplasmin it was improbable that any of the patients was suffering from his first attack of malaria, and in some cases fever had already been present for 20 days or more. The comparative decrease in the number of parasites in Cases 1, 2, 4, 5, and 7 was of interest, but could not be regarded as due to the effect of dimeplasmin when considered with the above statement, the other findings and the continued persistence of the asexual parasites.

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[1] James, S. P.: Malaria at Home and Abroad, London, 1920, p. 126.

TABLE I.—*Showing Dosage and Results of Treatment.*

Case.	Weight in kg.	Type of malaria.	Daily dose of dimeplasmin base given (mg. per kg. body-weight).		Days dimeplasmin was given.	Last day with fever.	Last day parasites found.	Day on which quinine was given.
			Initial daily dose.	Daily dose after 5th day.				
1	44	B.T.	10·8	28·8	10	10	10	11th
2	44·5	S.T.	10·7	28·7	11	11	11	12th
3	40	B.T.	12·0	32·0	10	10	10	11th
4	51	B.T.	9·2	25·1	10	3	10	11th
5	45	S.T.	10·6	28·4	10	9	10	11th
6	48	S.T.	10·0	26·6	10	8	10	11th
7	46·3	B.T.	10·3	27·6	10	4	10	11th
8	41	Q.	11·6	31·2	9	9	9	10th
9	44	S.T.	10·8	28·8	10	7	10	11th
10	37	S.T.	12·9	34·6	10	10	10	11th
11	38·5	S.T. and B.T.	12·5	33·2	6	6	6	7th

No toxic symptoms.

TABLE II.—*Showing Number of Parasites per 100 Leucocytes in Thick Films from Day to Day.*

Case.	Parasites.	Day of treatment.										
		1	2	3	4	5	6	7	8	9	10	11
1	B.T.	208	140	123	54	30	46	8	100	2	124	—
2	S.T.	170	100	16	0	2	1	2	1	12	12	117
	Cr.	0	0	0	2	2	2	5	1	2	1	2
3	B.T.	9	12	9	11	16	12	30	38	91	90	—
4	B.T.	34	10	2	2	5	2	6	5	12	4	—
5	S.T.	9	1	1	1	2	0	0·5	1	1	0·5	—
	Cr.	60	77	87	48	32	27	25	26	16	16	—
6	S.T.	53	38	5	6	18	20	82	66	78	120	—
	Cr.	0	5	7	3	5	4	6	0	1	1	—
7	B.T.	70	110	68	69	18	6	11	5	3	1	—
8	Q.	9	3	5	3	3	2	5	10	4	—	—
9	S.T.	10	58	1	290	4	950	43	360	23	140	—
	Cr.	2	2	2	0	1	0	0	0	0	0	—
10	S.T.	3	3	0	3	7	95	100	170	55	190	—
	Cr.	1	7	2	2	2	2	1	2	0	0	—
11	S.T.	175	250	130	264	134	224	—	—	—	—	—
	B.T.	33	36	26	56	26	12	—	—	—	—	—
	Cr.	2	0	1	0	2	0	—	—	—	—	—

Cr. = crescents.

Spleen measurements were made every second day with the patient in a recumbent position. In Case 2 the edge of the spleen was not palpable during treatment. In Case 1 no appreciable difference was noted. In Cases 3, 4, 6, 8, 9, and 10 the edge of the spleen receded somewhat, and in Cases 1, 5, 7, and 11 the spleen enlarged during treatment.

The *percentage of hæmoglobin* in the blood of each patient was estimated with a Dare hæmoglobinometer every second day and sometimes more frequently. In Cases 1, 7, and 11 there was a fall of about 10 per cent. in the hæmoglobin during dimeplasmin treatment. In the remaining cases no appreciable difference was noted.

Blood Pressure.—Dimeplasmin appeared to have no effect on the systolic or diastolic blood pressure, both of which were estimated at periods varying from ½ to 1½ hours after giving the drug.

Toxic Symptoms.—On the sixth day of treatment Case 8 complained of burning and pricking sensations of the eyes, combined with photophobia and some dimness of vision. These toxic symptoms increased in severity until the ninth day, when the dimeplasmin treatment was stopped. During the next 24 hours these symptoms, presumably due to dimeplasmin, disappeared.

Urinary Reactions.—When Mayer's reagent is added to the urine of patients taking quinine a whitish opalescent cloud forms which, if due to quinine, disappears on heating and reappears on cooling. A similar reaction was observed with the urine of patients taking dimeplasmin. Some difference was established, however, by contrasting the time of appearance and disappearance of this reaction after giving five grains of quinine bihydrochloride and five grains of dimeplasmin base on two separate occasions to a healthy male adult weighing 150 lb. and subsequently testing the urine at frequent intervals with Mayer's reagent.

The excretion of dimeplasmin did not begin until four hours after administration, but it continued for the next 24 hours. On the other hand, after giving quinine a positive reaction was obtained with the urine 40 minutes later. This reached its maximum intensity in the urine passed three and a half hours later, but the last faint traces of quinine had disappeared from the urine within 12 hours from the time of administration.

Summary.

1. Dimeplasmin is said to be effective within wide limits in destroying the plasmodia of bird malaria, but when the drug was given to 11 cases of human malaria in doses well within the therapeutic limits no evidence was obtained to show that it had any effect on the parasites or the malarial symptoms.

Dr. J. P. Fitzpatrick, medical officer to the District Hospital, Kuala Lumpur, has kindly afforded facilities for the trial of this drug in malaria cases. For permission to publish this paper and for his advice I am indebted to Dr. G. V. Allen, Acting Director, Institute for Medical Research, F.M.S.

SANOCRYSIN TREATMENT OF PULMONARY TUBERCULOSIS.*

BY FREDERICK HEAF, M.D. CAMB.,
MEDICAL SUPERINTENDENT, KING EDWARD VII. MEMORIAL SANATORIUM, WARWICK.

THE series which I describe in this paper consists of 97 cases of pulmonary tuberculosis treated with sanocrysin since 1925 at the Warwickshire Sanatorium. Of these 87 were adults and 10 were children. The series includes patients in all stages of the disease except the very advanced, and the majority had failed to respond satisfactorily to routine treatment. The adult cases had positive sputum at the commencement of treatment, and eight of the children showed definite pulmonary lesions by abnormal physical signs and radiographic shadows. The remaining two children were hilum cases with tuberculous cervical glands. In treating adults we have modified the dosage which

TABLE I.—*Sanocrysin Dosage (Adults).*

Injection.	Amount.	Day.	
1st	0·10 g.	—	
2nd	0·25 g.	5th	
3rd	0·35 g.	12th	
4th	0·50 g.	19th	Interval increased or decreased according to patient's weight.
5th	0·60 g.	26th	
6th	0·75 g.	36th	
7th	0·85 g.	50th	
8th	1·00 g.	64th	

Maximum dose tolerated is repeated every two weeks (weight permitting) until the case is arrested.

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* A paper read at a meeting of the Tuberculosis Association.

I published in 1926 and 1928 by lengthening the interval between each injection (Table I.).

During the fortnightly intervals the patient is kept in bed for a few days immediately after the injection, and then allowed to resume his exercises. One to three tablets of digalin are given immediately after each injection. The length of the interval is now decided by the weight of the patient. During the last year we have suspended treatment in cases when there was loss of weight after sanocrysin. As soon as a patient begins to lose weight we suspend treatment until the decline in the weight curve has stopped, when we recommence with a dose about 0·2 g. less than the last one. A rise of one or two degrees in temperature immediately after the injection is not considered unfavourable, but we try to avoid completely any shock reaction. By this method we obtain a rise in weight and an improvement in general condition throughout treatment. Doses varying from 0·5 g. to 1·0 g., according to the gain in weight, are continued if possible until the sputum is negative and symptoms have disappeared. This may mean a long period. By our "non-shock" methods I think we have been as successful as other observers in obtaining elimination of tubercle bacilli from the sputum, rapid clearing in the X ray picture, and decrease in the physical signs in a good percentage of cases. From recent literature it seems that the majority of cases respond well to treatment, particularly with respect to the above three points, to which I ought to add one which has been noted constantly in our work—the decrease in the sedimentation-rate of the red blood corpuscles. This, unfortunately, is only permanent in a few cases.

TABLE II.—*Immediate Results of Sanocrysin Treatment.*

Stage.	No. of cases.	T.B. (—).	Clinically arrested.	Improved.	Worse.	Died.
I. (T.G.) ..	9	8	8	1	—	—
II. (T.G.) ..	42	23	9	31	1	—
III. (T.G.) ..	21	3	—	9	8	4
Sanocrysin and A.P. combined treatment (all stages) ..	15	7	7	5	2	1

A.P. = artificial pneumothorax.

There seems to be good evidence from the figures in Table II. that the drug has a distinct value in bilateral cases in turning the balance from a bad to a favourable result when used in conjunction with collapse therapy.

There may be some difference of opinion as to which cases are suitable, but we have found that, provided the renal and cardiac systems are normal, you can treat cases in any stages of the Turban-Gerhardt classification regardless of fibrosis, and obtain temporary improvement, if the physique and general condition is good and there is an absence of symptoms of abdominal tuberculosis. In Stage III., however, there is practically no permanent improvement. For this reason I think it a waste of good money to treat Stage III. cases with sanocrysin.

It is very difficult to determine the permanency of the good immediate result of sanocrysin, as each case returns to such different home conditions that comparisons are almost impossible.

Table III. gives the remote results according to the stage of the case. Although the Stage I. cases continue to keep fit many of the Stage II. cases have relapsed, and all except three of the Stage III. cases have died within two and a half years of leaving the sanatorium. Comparison of these figures with the after-histories of patients on routine treatment shows that no advantage has been gained by treatment with sanocrysin except in cases which were clinically arrested on discharge from the sanatorium—i.e., in whom symptoms had disappeared and tubercle bacilli were not found after five sputum examinations. It appears that unless the patient attains this desirable condition he will derive little or no permanent benefit from sanocrysin.

TABLE III.—*Results of Sanocrysin Treatment.*

Stage.	Years after treatment.	Clinically arrested.			Improved.			Worse.		
		F.	R.	D.	F.	R.	D.	F.	R.	D.
I. ..	1	1	—	—	—	—	—	—	—	—
	1½	—	—	—	—	—	—	—	—	—
	2	—	—	—	1	—	—	—	—	—
	2½	3	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	3½	4	—	—	—	—	—	—	—	—
II. ..	1	3	—	—	3	1	2	—	—	2
	1½	1	—	—	1	1	2	—	—	—
	2	1	—	—	1	3	2	—	—	—
	2½	—	1	—	4	1	—	—	—	—
	3	1	—	—	3	3	1*	—	—	—
	3½	2	—	—	—	—	3†	—	—	—
III. ..	1	—	—	—	—	1	3	—	—	5
	1½	—	—	—	1	—	2	—	—	2
	2	—	—	—	—	—	—	—	—	1
	2½	—	—	—	2	—	—	—	—	—
A.P. cases	1	3	—	—	1	—	—	—	—	2
	1½	—	—	—	—	1	—	—	—	—
	2	2	—	1	1	1	—	—	—	—
	2½	1	—	—	—	—	1	—	—	—
	3	—	—	—	—	—	—	—	—	—

F = fit; R. = relapsed; D. = dead. A.P. = artificial pneumothorax.

Stage I.—8 clinically arrested; 1 improved; 0 worse.
Stage II.—9 clinically arrested; 31 improved; 2 worse.
* Only six months after treatment. † Unknown.
Stage III.—0 clinically arrested; 9 improved; 8 worse.
A.P. cases.—7 clinically arrested; 5 improved; 2 worse.

TABLE IV.—*Routine Treatment: Mortality Since Discharge.**

448 arrested cases.		632 much improved cases.	
Years since discharge.	Deaths.	Years since discharge.	Deaths.
0	7	0	39
1	9	1	58
2	16	2	43
3	15	3	38
4	4	4	27
5	7	5	16
6	4	6	9
7	2	7	2
8	—	8	3
Total ..	61		235

* Figures given by Dr. Bardswell in Special Report Series No. 33, Medical Research Committee. Although these figures are not of the same order as the small numbers in the sanocrysin figures, they do show that the greatest number of deaths occur in the first four years—the period which we are considering in the sanocrysin cases.

TABLE IVA.—*Artificial Pneumothorax Treatment.*

Stage.	Years after treatment.	Clinically arrested.			Improved.			Worse.		
		F.	R.	D.	F.	R.	D.	F.	R.	D.
I. ..	1	1	—	—	—	—	—	—	—	—
	1½	2	—	—	—	—	—	—	—	—
	2	1	—	—	—	—	—	—	—	—
	2½	—	—	—	—	—	—	—	—	—
	3	1	—	—	—	—	—	—	—	—
	3½	2	—	—	—	—	—	—	—	—
	4	2	—	—	—	—	—	—	—	—
II. ..	1	2	—	—	2	4	1	—	—	1
	1½	6	2	—	—	—	2	—	—	—
	2	3	—	—	—	2	1	—	—	—
	2½	5	1	—	—	1	2	—	—	—
	3	2	1	—	—	—	—	—	—	—
	3½	1	—	—	1	—	—	—	—	—
	4	1	1	—	—	—	—	—	—	—

Stage I.—9 clinically arrested; 0 improved; 0 worse.
Stage II.—25 clinically arrested; 16 improved; 1 worse.

Sanocrysin Compared with Artificial Pneumothorax.

In order to see how sanocrysin results compared with those of artificial pneumothorax, I took the first 51 cases which had had the latter treatment at the sanatorium. I excluded cases in which the collapse treatment was given to stop an hæmoptysis or cases in which treatment had to be abandoned owing to adhesions, and "last-resort" cases. Curiously enough, I found I had nine Stage I. and 42 Stage II. cases amongst the 51. From this I think it fair to assume that the cases were comparable with the 51 sanocrysin cases under examination. Table IV. shows that the immediate and remote results obtained from the artificial pneumothorax treatment are considerably superior to those from sanocrysin.

The Treatment of Children.

Four of the ten children treated had positive sputum, four had definite physical signs accompanied by abnormal radiographic shadows in the lungs, and two were hilum cases. In two cases only could the diagnosis be disputed and both these had definite tuberculous glands of the neck. All the children had had long periods of routine treatment, and for some weeks had made no progress or gain in weight, and therefore could be considered at a standstill when sanocrysin treatment was commenced.

The dosage we employ for children is shown in Table V.

TABLE V.—*Dosage of Sanocrysin for Children.*

Injection.	Amount in grammes.	Day.	Injection.	Amount in grammes.	Day.
1st	0·05	—	5th	0·25	40th
2nd	0·10	10th	6th	0·30	54th
3rd	0·15	20th	7th	0·40	68th
4th	0·20	30th	8th	0·50	82nd

Maximum dose tolerated is repeated at fortnightly intervals (weight permitting).

With these doses the patients have been entirely free from any undesirable symptoms during treatment, and, what is more remarkable, every case has shown a good increase in weight throughout the time when the injections were being given. The child seems to tolerate very large doses without any ill-effects; most of the children between 5 and 8 have received 0·5 g. and have still maintained and increased their weight. The children are kept in bed for four to six days after each injection and then allowed to go to school as usual. In every child to whom prolonged treatment has been given we have noted increased appetite, decrease of symptoms, and improved general condition. No cases with abdominal symptoms have been treated.

TABLE VI.—*Results of Sanocrysin Treatment in Children.*

No.	Age.	Sputum.	Type.	Total amount given in grms.	No. of inj.	Gain in weight (lbs.).	Gain per week on— Routine treatment (lbs.).	Gain per week on— Sanocrysin (lbs.).	Sputum after treatment.
1	13	+ve	Pulm. rt. lung	4·0	14	6	4/37	6/50	+ve
2	9	+ve	Pulm. rt. and lt.	13·5	36	22	14/38	22/46	(—)ve
3	10	+ve	Pulm. rt. and lt.	1·0	6	1	3/13	1/8	+ve
4	6	0	Pulm. lt. lung	11	16	11	4/22	11/24	0
5	5	0	Glands. Hilum.	6·6	27	14	1/6	14/40	0
6	5	0	Pulm. rt.	2·9	12	6	5/11	6/18	0
7	6	0	Glands. Hilum.	3·6	12	7	6/20	7/32	0
8	11	+ve	Pulm. rt. and lt.	3·0	10	8	32/50	8/12	(—)ve
9	12	0	Pulm. rt.	5·1	16	18	12/38	21/52	0
10	14	+ve	,,	8·0	27	24	9/16	24/45	(—)ve

Conclusions.

(1) Providing the case has fairly good physique and no abdominal tuberculosis and that other vital organs are normal it is reasonable to assume that the immediate results with sanocrysin will be good and that the patient will benefit by the treatment.

(2) It is particularly useful in bilateral cases treated by collapse therapy, and the patient need not develop shock symptoms or a febrile reaction in order to obtain full benefit from the treatment.

(3) By suitable dosage all shock and unfavourable symptoms can be avoided, and the patient's weight should increase throughout treatment, although large doses are given.

(4) The remote results are only encouraging in those cases which lose their tubercle bacilli and become clinically arrested after treatment.

(5) Sanocrysin is well tolerated by children, and most encouraging immediate results have been obtained in children suffering from pulmonary tuberculosis who did not respond to routine treatment.

Clinical and Laboratory Notes.

SOME PHARMACOLOGICAL ACTIONS OF BANISTERINE (HARMINE).

BY J. A. GUNN, M.D., D.SC. EDIN.,
PROFESSOR OF PHARMACOLOGY IN THE UNIVERSITY OF OXFORD.

IN a recent note in THE LANCET (April 13th, p. 769) I drew attention to published observations which tend to support, from the pharmacological viewpoint, the chemical and other evidence of the identity of the alkaloids banisterine and harmine. No complete comparison of the pharmacological actions of the two alkaloids was possible, largely from want of knowledge of some of the effects of banisterine; and suggestions were made as to some crucial experiments which might be made by anyone who possessed banisterine to make this comparison sufficiently complete. Upon the publication of this note E. Merck generously and voluntarily sent me not only a small supply of banisterine hydrochloride to enable me to perform the necessary experiments, but also an advance proof of articles to appear in next "Jahresbericht," dealing with the chemistry and pharmacology of the alkaloids in question.

In this paper I wish to record briefly the results of some experiments with banisterine. As the identity of the alkaloids has been recently confirmed by microcrystallographic methods as well as in other ways, it seems hardly necessary to enter into the pharmacological resemblances in great detail, and the few experiments I wish to record are intended not only to emphasise the identity of pharmacological actions, but also to clear up some disputed points in regard to these actions themselves.

Action on Uterine Muscle and Spleen.

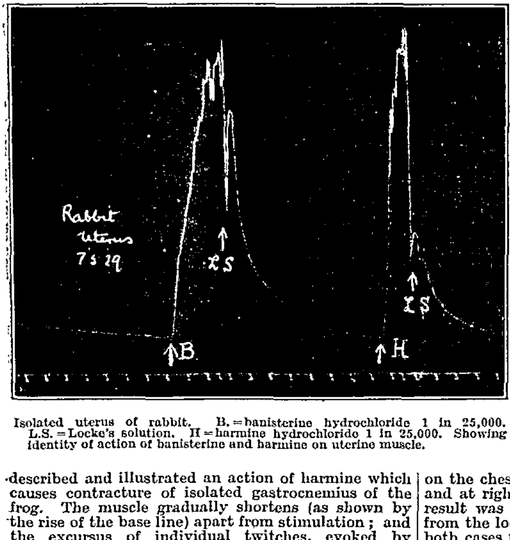
In my original papers (references are given in the previous article) I described and illustrated the action of harmine and harmaline on the uterus, and ascribed it to a stimulant action on uterine muscle, similar to that produced by quinine. In the proof of the Jahresbericht which I have received, Kreitmair states that, from the occurrence of menorrhagia following the clinical use of harmine, attention was drawn to its action on the uterus. It was found, in rabbits, that neither harmine nor harmaline had any stimulant action on the isolated uterus but caused contraction of this organ in the intact anæsthetised animal, when the alkaloids were injected intravenously. The conclusion was drawn that harmine and harmaline have no peripheral action on the uterus but that the contractions are induced by central stimulation.

Apart from the inherent improbability of any such action (for the uterus seems to be singularly uninfluenced by central stimulation), the assumption is based upon experimental error, because both alkaloids have a powerful action on the isolated rabbit's uterus. In my experience it is an action that is unfailingly exhibited on the exsected parous rabbit's uterus with concentrations of from 1 in 5000 to 1 in 50,000. Fig. 1 shows the effects of banisterine and harmine on the isolated uterus of a rabbit which had been recently pregnant and was in active lactation. At the arrow marked B, banisterine hydrochloride was added to the Locke's solution in the bath containing the uterus, in an amount to make the concentration 1 in 25,000. This caused a contraction of about 6 cm.'s height on the tracing. After about two minutes the banisterine solution was run off from the bath and replaced by Locke's solution, whereupon the uterus rapidly relaxed and in four minutes had reached its normal level of tone. Harmine hydrochloride was then added to the bath in an amount to make the concentration 1 in 25,000. This evoked a contraction of the uterus as nearly as possible identical in height with that which had previously been produced by the same concentration of banisterine. In a similar experiment on another segment of the same uterus, 1 in 50,000 of each alkaloid produced a contraction giving rise to an excursion of 4 cm. on the tracing. It is clear from these experiments: (1) that both alkaloids produce similar effects, quantitative and qualitative, on the uterus; and (2) that the action in both cases is a peripheral one on the uterine muscle. The identity of action of the two alkaloids was also confirmed by their effects on the spleen. Both produced similar relaxation of the isolated rabbit's spleen in concentrations of 1 in 10,000.

Action on Voluntary Muscle.

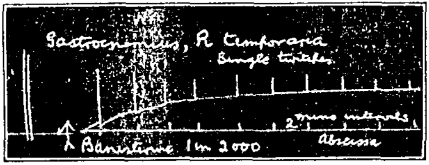
A third action which seemed useful for this comparison is that on voluntary muscle. I have described and illustrated an action of harmine which causes contracture of isolated gastrocnemius of the frog. The muscle gradually shortens (as shown by the rise of the base line) apart from stimulation; and the excursus of individual twitches, evoked by electric stimulation, diminishes. This leads to "paralysis" of the muscle in the contracted position. This effect is produced in a few minutes by concentrations of 1 in 1000 or greater, and more slowly by concentrations down to 1 in 5000. Fig. 2 shows exactly the same effect produced by banisterine 1 in 2000. The muscle was immersed in Ringer's solution and could be stimulated electrically when desired. Two normal twitches are shown as lines on the slowly revolving drum. At the arrow-mark, Ringer's solution was replaced by banisterine hydrochloride, 1 in 2000 dissolved in Ringer's solution. Almost immediately the muscle began to shorten and the height of induced contractions to diminish. The same strength of stimulus was used throughout. The effect of banisterine is identical with what I have previously described with harmine.

FIG. 1.



Isolated uterus of rabbit. B. = banisterine hydrochloride 1 in 25,000. L.S. = Locke's solution. H = harmine hydrochloride 1 in 25,000. Showing identity of action of banisterine and harmine on uterine muscle.

FIG. 2.



Isolated gastrocnemius of frog. Showing gradual shortening of the muscle and diminution of induced contractions produced by banisterine hydrochloride, 1 in 2000. The same effect is produced by harmine.

In my previous note I pointed out that, if Lewin's observations were correct, there seemed to be some difference between the actions of harmine and banisterine on the central nervous system of the frog, but suggested that possibly Lewin had confused a local contracture of the back muscles with a strychnine-like *opisthotonus*. Experiments with banisterine have confirmed this suggestion. Harmaline does, as I have shown, produce a slight and transient increase of excitability of the spinal reflexes in the frog, and this may also occur with harmine. The chief effect, however, is one of paralysis of spinal reflexes, and there is nothing at all comparable to strychnine convulsions. The opisthotonic posture which Lewin described as occurring with banisterine and as persisting after death is due, as I anticipated, to the contracture of the muscles of the back resulting from local action of the injected solution, which must be at least more concentrated than 1 in 1000 to get the required dose into a convenient bulk for injection. However, that the posture assumed is due to this and not to any central action was easily proved by the following experiment. Two frogs, *R. temporaria*, each weighing 10 g., were given a dose of 0·005 g. dissolved in 1 c.cm. Ringer's solution. This represented 0·5 g. per kg. and the concentration of the injected solution was 1 in 200. In the one frog the injection was made into the dorsal lymph sac, in the other into the ventral lymph sac. In the former opisthotonic curvature of the back was produced, whereas in the latter the head was flexed on the chest and the arms were held rigidly in front and at right angles to the body. In both cases the result was due to rigidity of the muscles resulting from the local action of the injected solution, and in both cases the peculiar posture was maintained after death. The opisthotonus is clearly, therefore, not due to any action of banisterine on central nervous system; and the posture assumed, depending as it does upon local contracture of the muscles, varies with the site of injection. The same result was obtained with harmine.

Identity of Banisterine and Harmine.

The pharmacological, like the chemical, evidence for the identity of banisterine and harmine is, therefore, now sufficiently complete. This has been shown in regard to lethality, symptomatology, and to effects on isolated tissues such as the uterus, spleen, and voluntary muscle. This identity is of practical importance in two directions. In the first place, as has been elsewhere emphasised, harmine is at the present time more easily obtainable than banisterine, so that it can be more easily procured for clinical use, should uses for it be established. In the second place, owing to the chemical researches of Perkin, Robinson, and others, an accurate knowledge is to hand even of the structural composition of the harmala alkaloids and of many of their derivatives, some of which may prove of greater therapeutic value than harmine itself. I have, in the past year, for example, made estimations of the actions on the uterus of the three alkaloids and of quinine in relation to their general toxicity, with a view to discovering whether any one of the former might be more effective as an ecbolic than quinine. The final decision on this and other points must, however, rest upon clinical evidence which is not yet available.

I wish to express my grateful thanks to the firm of Merck for their kindness in giving me the supply of banisterine which made these experiments possible.

TREATMENT OF TUBERCULOSIS BY "BENZYL CINNAMIC ESTER"

(THE METHOD OF JACOBSON).

ITS USE IN LARYNGEAL TUBERCULOSIS.

BY H. GAINSBOROUGH, M.D. CAMB., F.R.C.P. LOND.,
PHYSICIAN TO ST. GEORGE'S HOSPITAL
AND
P. J. JORY, F.R.C.S. ENG.,
SURGEON TO EAR, NOSE, AND THROAT DEPARTMENT, ST. GEORGE'S HOSPITAL; LARYNGOLOGIST TO MOUNT VERNON HOSPITAL.

IN a previous note one of us[1] gave an account of investigations on the treatment of tuberculosis by Jacobson's solution of "benzyl cinnamic ester," together with a record of cases treated in this country. The results, particularly in certain groups of cases, have been promising, and it was thought worth while to continue the investigations on cases which could be controlled, if possible, by visual examination. With this idea in view we treated cases of laryngeal tuberculosis, a condition in which the progress of the disease could be observed accurately and the functional results could be estimated. Dufourmentel and Sebileau[2] in 1924 published an account of tuberculous laryngitis treated by this method, describing two cases in detail. They stated that they obtained encouraging results in most of their cases, especially in the relief of hoarseness, pain, and dysphagia, and they noted regressive changes in the local condition. Caboche[3] reported to the Congrès d'Oto-Rhino-Laryngologie in 1927 both functional and anatomical improvement and also improvement in the patient's general condition.

We selected cases in which the condition appeared to be either stationary or definitely getting worse, while they were under observation at the sanatorium, so that we dealt with a group of cases in which the general prognosis was very poor. The method of treatment was that described in the previous paper (1928) and consisted of a series of daily intramuscular injections of 0·25 c.cm. of Jacobson's solution for 12 days, followed by a rest of 15 days. After three series had been given, a rest of one month was allowed before resuming treatment. Unfortunately, owing to the closing of the sanatorium, we were unable to continue the treatment of these cases for more than three months, but we feel, nevertheless, that the results are sufficiently definite and encouraging. In no case did any unpleasant reaction occur.

Case Reports.

CASE 1.—Male, aged 43, had had hoarseness for three years, and showed ulceration of the left cord, injection of the right cord, and marked arytenoid swelling, worse on the left side. He had active fibro-caseous tuberculosis throughout both lungs, but was afebrile. The laryngeal condition was stationary. After three months' treatment there was marked improvement in his voice and general condition. The arytenoid swelling diminished and the movement of the cords improved. Five months after cessation of treatment he was back at work as a carpenter and the voice was stronger.

CASE 2.—Male, aged 29, had had hoarseness for about four months and had been in the sanatorium for three months. The larynx showed ulceration of the left cord, which was immobile, and swelling of the left arytenoid. The condition was stationary. The upper two-thirds of both lungs showed advanced disease. The evening temperature went up to 99·8° F. By the end of the first series of injections he had become afebrile and expectoration had ceased. Locally the arytenoid swelling had diminished and the cord movement had improved. Pain had also diminished. Throughout the period of treatment the improvement continued, the pain in the throat disappeared, and the laryngeal condition became inactive in appearance.

CASE 3.—Female, aged 44, had a six years' history of "laryngitis." The larynx showed ulceration of the right cord and swelling of both arytenoids. Besides hoarseness, there was some dysphagia and pain in the throat, shooting up to the ear. The laryngeal condition had been getting worse during five weeks' previous observation in the sanatorium. The general condition was very poor indeed, and there was extensive disease of the lungs, with much cavitation on the right side. Dysphagia disappeared and pain diminished during the first series of injections, and very considerable improvement occurred in the general condition; expectoration diminished and the voice became much stronger. Locally there was diminution of ulceration of the cord, almost to healing, and the arytenoid swelling had decreased.

CASE 4.—Female aged 16. The history was suggestive of phthisis during the past two years. Hoarseness began while in the sanatorium; at first there was only œdema of the arytenoids, but later there was ulceration on the anterior surface of the right arytenoid and the swelling of both cartilages increased. There was no pain or dysphagia and very little sputum. The pulmonary disease was extensive and bilateral. At the end of three months' treatment the hoarseness had much improved. There was at first diminution of the arytenoid swelling—the anterior surface of the right arytenoid became smoother—but there was some return of swelling about three weeks after the last series of injections. The patient became afebrile and expectoration practically ceased.

CASE 5.—Female, aged 20, gave a history of hoarseness for a few weeks only. There was swelling of both arytenoids with slight ulceration and injection of the cords, and some discomfort in the throat. The upper half of the right lung was diseased, with considerable pleural thickening. Between the first and second series of injections there was a severe attack of acute tonsillitis, followed by a rapid consolidation of the lower lobe of the right lung and accompanied by considerable pyrexia. By the end of the third series of injections the patient was afebrile, the discomfort in the throat had gone, the laryngeal condition showed improvement, cord movement was better, the arytenoid swelling had diminished slightly, and no ulceration could be seen.

CASE 6.—Female, aged 23, gave a history of phthisis for three years, but laryngitis was first noted while in the sanatorium and during three months' observation was gradually getting worse. At first there was only arytenoid swelling and injection of the left cord, but later the posterior part of the left cord and the arytenoid became ulcerated. There was a good deal of pain in the throat and some dysphagia. There was extensive disease in both lungs, and the temperature was unstable. During the treatment the pain and dysphagia vanished; at the end of three months there was less swelling of the arytenoid but the improvement was not very marked.

CASE 7.—Male, aged 41, had had hoarseness for five years and had been aphonic for a few weeks. He had had tuberculosis of the right hip since the age of 3. There was a discharging sinus in the groin, and the head of the femur was completely destroyed. There was tuberculous disease throughout both lungs. The larynx showed an infantile epiglottis; at first there was only swelling of the arytenoids, but this increased and the arytenoids and cords became ulcerated. He was practically afebrile. After two series of injections there was some decrease of arytenoid swelling and some recovery of voice, but during the third series he *became worse, the laryngeal œdema increased until tracheotomy* was required, a large abscess developed in the right thigh, and the patient died of lobar pneumonia.

Conclusions.

Improvement of the laryngeal condition, in varying degree, was observed in all the cases, but in Case 6 the favourable change was slight and in Case 7 improvement was not maintained. The functional results corresponded, but the most striking feature was the disappearance of pain and dysphagia during the treatment. Remembering the severity of the cases and their previous failure to improve, our results suggest that such benefits as were obtained were the result of the treatment. All cases remained with sputum positive at the end of the treatment. Improvement in the patient's general condition was noteworthy in the first four cases. It is not proposed to discuss the lung changes in detail, but progressive changes in radiographic appearances were noticeable as a result of the three months' treatment in all the cases except 4 and 7. The changes were increased hardening of the shadows and in Cases 2 and 3 some increase of translucency of the lungs.

In conclusion we have to thank the Honorary Physicians of the Mount Vernon Hospital for permission to use their cases, and also Dr. W. G. Kinton for his continual help and courtesy.

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Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF EPIDEMIOLOGY.

AT a meeting of this Section on May 24th, Dr. S. MONCKTON COPEMAN, F.R.S., Vice-President, being in the chair, Dr. A. JOE read a paper on

PUERPERAL FEVER AND PYREXIAS.

He said that between the date on which the new regulations came into force (Oct. 1st, 1926) and Sept. 30th, 1928, 219 cases of puerperal fever and pyrexia had passed through the North-Western Fever Hospital. These cases he had classified, adopting the plan of Mr. James Wyatt in the Metropolitan Asylums Board Report. This was as follows: (1) local uterine infections; (2) pelvic or general peritonitis; (3) pelvic cellulitis; (4) general infections of the blood stream. For the purpose of the present survey he had added two more classes: (5) infections of the urinary tract; (6) a miscellaneous group, comprising mental disturbance, constipation, breast troubles, and various conditions which had appeared to be accidental to the puerperal state.

The 219 cases seen in the period named were ranged as follows: Group 1, 71 cases; Group 2, 47; Group 3, 11; Group 4, 20; Group 5, 12; Group 6, 58. Of the 47 cases in the second group, 23 had pelvic and 24 general peritonitis. Of the 20 blood infections, 12 had septicæmia, 8 pyæmia; three cases of septicæmia and one of pyæmia had general peritonitis in addition. The urinary infection cases were practically all due to *B. coli*. The deaths due to peritonitis constituted 36·1 per cent. of the total mortality; they were due to general peritonitis. Dr. Joe said he was surprised at the smallness of the figure for pelvic cellulitis; it might be a remote effect. One death occurred among the 11 cases and this death was due either to acute lobar pneumonia or to general tuberculosis. Death occurred in 10 out of 12 general septicæmic cases. Among the 149 cases in Groups 1 to 4, 32 were fatal, giving a percentage mortality of 21·4.

Details of Cases.

To give an idea of the circumstances attending the fatal cases, Dr. Joe related particulars of a number of them. Of the 32 puerperal deaths, 7 were the result of septic conditions supervening on abortion. In one a coroner's jury found a verdict of wilful murder, while two others were adjudged to have resulted from improper interference. Apart from the abortion cases, 11 of the remaining 25 were primiparæ, 3 were multiparæ; and one died before she could be questioned. Among the primiparæ, ten had instrumental delivery, six had lacerations of the birth canal, one had a slight tear. In the multiparæ nine had normal labour, four instrumental. In 11 cases no vaginal examination was made before the confinement; 50 women in all had sustained damage to the birth canal. Dr. Joe contended that in order to form some rational basis of prevention of puerperal fever it would be necessary to make a careful study of such details as he had investigated. It was disturbing to find, in a considerable series of cases, that 20 per cent. of the maternal deaths had supervened upon abortion, a fraction of them having been due to illegal interference. This proportion would probably have been found to be still higher if all the patients could have been cross-examined. 34·4 per cent. of the total number of deaths occurred in primiparæ; the factor of trauma seemed to bulk largely in these deaths. Still, it was impossible to overlook the experience of the group of multiparæ; in both the fatal and the recovered cases, the multiparæ outnumbered the primiparæ, and in the majority of the former cases the labour was apparently free from any such trauma as gross laceration. Thus, even if, by the exercise of complete obstetrical precautions, avoidable trauma could be eliminated in primiparæ, they would still be exposed to the same order of risks as were multiparæ. Cases of pyelitis, he held, were responsible for a certain proportion of the mortality. The miscellaneous class constituted 20·4 per cent. of the total, and they were cases which, but for the operation of the new regulations, would probably have escaped notification. The cases in the intercurrent disease group showed a liability to incur *bronchial complications.*

The Dick Test.

The question of the causal organism was one of very great importance. Every worker on the subject had held that the chief organism responsible for these cases was a hæmolytic streptococcus. The weight of evidence was against the likelihood that a specific strain was concerned. The normal habitat of this organism seemed to be the nasopharynx of people subject to catarrh. The source of infection could be narrowed down to the nasopharynx of the patient herself and those of her contacts during labour. There had been coincident outbreaks of scarlet fever and puerperal fever in maternity homes. The organism in the puerperal cases might be confined to the uterine lymphatics. If the main reservoir of the hæmolytic streptococcus was the nasopharynx, droplet infection was a mode of transmission over which only partial control could be expected. Mr. H. Burt-White had recently published a paper which indicated that there might exist a connexion between sensitivity to the hæmolytic streptococcus and the incidence of streptococcal infections in the puerperium. At the time that paper appeared a number of Dick tests had been carried out in the wards of the North-Western Fever Hospital. These had now been extended, and the results were available. Cases were tested on admission by the intercutaneous administration of 1 in 200 and 1 in 1000 dilutions of Dick toxin. Controls were done by a similar injection of inactivated toxin. They were practically consecutive cases, only a few being discarded because they had received large doses of antistreptococcus vaccine before arrival. 23 per cent. were found to be positive, 77 per cent. negative to a dilution of 1 in 1000. The figures obtained from 103 cases tested did not support the sensitivity suggestion. Among 77 adults in the general population of ages ranging from 20 to 40 years, 22 per cent. were Dick positive.

From the 103 cases to which the Dick test had been applied Dr. Joe took 22 practically consecutive ones and isolated the hæmolytic streptococcus from them: it was obtained from the cervix in the local uterine infections, and in the cases of pelvic peritonitis, from the exudate of general peritonitis cases and from the abscesses in pyæmic cases. Among 12 local uterine infections 4 patients were Dick positive, among 4 patients with pelvic peritonitis 2 were Dick positive, and of 2 patients with general peritonitis 1 was Dick positive. Three patients with septicæmia and one with pyæmia were all Dick negative. Thus it would seem that the invasion by the hæmolytic streptococcus was not restricted to the Dick positive cases. Experience in regard to the use of antistreptococcal sera for streptococcal lesions generally prepared one for the failure of this method in the kind of cases under review.

Discussion.

The CHAIRMAN said that this question of maternal morbidity was of the very greatest importance; it was rather a blot on our boasted improvements in the field of preventive medicine that so little improvement in the figures had been secured over a considerable period of years. It was desirable that by the most intensive investigations all information possible on the various factors concerned should be gleaned and classified. The work of Dr. Joe and his colleagues at the North-Western Fever Hospital had certainly done much in this direction. A very large amount of work, from the bacteriological and epidemiological points of view, had been carried out at the Pathological Department of the Ministry of Health, and in the various laboratories associated with that work. The exact place in causation occupied by the hæmolytic streptococcus must be cleared up if advance was to be made in the prevention and cure of this important disease. As to treatment, to his knowledge the use of turpentine, internally as a medicine and externally as stupes, or as enemata for puerperal fever, had been tried with considerable success in a small number of cases, and he wondered whether, in default of anything better, it would be worth while testing this treatment in an institution where the results could be definitely controlled.

Dr. F. F. CAIGER said that little benefit to the human race seemed to have resulted from the amount of work which had been done, clinically and in laboratories, in connexion with puerperal sepsis. Forty years ago, when as resident accoucheur at St. Thomas's he had 600 confinement cases, he had lost only one patient. In Switzerland the main attention seemed to be devoted to guarding against thrombosis; and even in the cases which appeared to call for some treatment, gymnastics was largely enjoined. For practical improvement in the results in puerperal fever he considered that one must look to the laboratory.

Dr. L. COLEBROOK congratulated Dr. Joe on the results of his Dick tests, which were similar to those obtained in other parts of the country. The idea must now be abandoned, he thought, that the Dick test could be regarded in the same light as the Schick test in diphtheria. There seemed to be no connexion between the Dick sensitiveness and the liability to infection by the hæmolytic streptococcus. He thought with Dr. Joe, that probably the toxæmia was not the most important side of puerperal fever. Attention must be focused primarily on the bacterial invasion.

Dr. PHYLLIS DIXON asked whether Dr. Joe had to work upon a select group of particularly severe cases. She had found *Streptococcus pyogenes* in infected cases, and considered that many other infections than those due to streptococci were definitely morbid.

Dr. J. A. BRINCKER asked whether attempts had been made, in the cases under review, to ascertain what particular type of streptococcus was present. Did the cases which were Dick negative profit by the use of antistreptococcus serum?

Dr. HAROLD BUTLER said it had been made clear that the responsible organism was the hæmolytic streptococcus, which started in the nasopharynx and wandered about the body. He had once suggested that infection of the vagina might have sprung from the anus, but had been informed that fæces did not normally contain these organisms. Dr. A. F. Hurst, however, had shown that some 4 per cent. of all people went through life with a lack of acid secretion in the stomach. Those people could not sterilise the food in their stomach; therefore, he argued, if women with this achlorhydria had in the fauces, and swallowed, the hæmolytic streptococcus, it would appear in a virulent form in the fæces and could easily infect the adjacent vagina. Dr. Hurst had shown that in these people the organisms usually found in the large bowel travelled upwards and were found in the stomach. Many subjects of even virulent puerperal fever had suffered no traumatism, and such factors as he had mentioned might well have a bearing.

Reply.

Dr. JOE, in reply, said treatment scarcely came into his province, but after seeing a large number of cases his conclusion was that in cases which seemed liable to die, nothing so far tried seemed successful in averting that end. In some, laparotomy and drainage of the peritoneal cavity saved life; in a few, antistreptococcus serum appeared to give a good result. He agreed that everything possible should be tried, whether it seemed to have a rational basis or not. The cases he had seen were not selected in any way. He agreed with Dr. Butler that the transfer of organisms from the anus to the vagina was a possibility. Though the hæmolytic streptococcus was not a normal denizen of the colon, it might easily be so in subjects of achlorhydria.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.

THE MAUDSLEY LECTURE.

ON May 22nd the Maudsley Lecture was delivered by Prof. C. SPEARMAN, F.R.S., in the Botanical Theatre of University College, London, the chair being occupied by Prof. J. SHAW BOLTON (Macclesfield), the President. The subject of the lecture was the

Psychiatric Use of the Methods and Results of Experimental Psychology,

and Prof. Spearman began by confessing that psychology was passing through a crisis. Half a dozen theories had, he said, been advanced, for each of which the name the "new" psychology was claimed. The authors of these systems regarded them as superseding the older views. Yet the great majority of psychologists held to the experimental method, and continued the spade work by which they were accumulating material to which any theory must in the long run conform. The theories, old and new, were not so antagonistic as many contended. Each represented some partial truth, its weakness consisting in what it overlooked and denied. Much of what in latter days was set forth as revolutionary was in reality very old material to which new nomenclature had been attached. What was needed was a more intimate collaboration between psychiatry and psychology.

On the relationship between mind and body he took up a definite attitude. Some averred that the body alone was worthy of serious scientific consideration, that it alone had causal significance, the mind being no more than an epiphenomenon. Others declared that the body was but one of the dreams which the mind had created for itself. His own view was that the mind and the body must each be studied first in and for itself, and then the relationship of each to the other. To-day, he would confine himself to terms of mind. Psychology, like all genuine science, must be based on principles, not on a mere observation of details. These principles were partly ultimate concepts, partly ultimate laws. The primary purpose of concepts was to array the material into perspicuous classes. The laws linked these concepts together. One conceptual achievement, over two thousand years old, was the division of mental processes into three classes: (1) cognition (or knowing); (2) affection (or feeling); (3) conation (or striving). The connexion between the last two was so intimate that it was difficult to keep them distinct; but failure to recognise the line of demarcation between cognition and the other two had been answerable for many grave aberrations. The doctrine of sensationism he dismissed as inadequate for psychiatric purposes. Still, within a limited field—that in which a patient had himself noticed something abnormal, or some ground existed for suspecting some sensory disturbance—sensations could play an important part in psychopathology.

Passing beyond the region of sensation, what, asked the lecturer, remained? The answer throughout the ages had taken the form of postulating "formal faculties." The most widely adopted of these were "apperception," "attention," "memory," "imagination"; together with some such supreme ruler as the "intellect," or "intelligence," or "reason." There was a variety of meanings attached by different people to each of these terms. To be acceptable, these "faculties" should indicate not merely a class, but a functional unity, so that wide-ranging generalities could be predicted of it. A person may be adjudged to be suffering from deficient power to concentrate his attention. A very large foreign railway company required every prospective employee to submit himself to a test which consisted of making the subject look over a list of figures (numbers), then look at a smaller list at the back of the paper, and tick off those occurring in both lists. If the man left many of the proper numbers unticked, he was considered to have a deficient power of concentration. The fallacy of such a conclusion, however, was that he might be capable of deep and prolonged attention to matters more to his liking. This might perhaps be true of the other supposed faculties also. Psychologists had accordingly changed their line of attack; they were now trying to find which, if any, of the faculties functioned in a unitary manner, rather than increasing the number of the faculties. This search for faculties which functioned in a unitary way had been richly rewarded; and it had shown, too, that many supposed faculties had no real foundation. In rare and valuable cases genuine faculties had been discovered—i.e., those in regard to which measurements made with one kind of material gave measureable evidence with regard to further kinds. He asked that these genuine faculties should now be tried out on differences of a pathological order.

Measurements of General and Special Ability (*G. and S.*)

In the sphere of "intelligence" light was afforded by way of mathematics. After groups of persons had been submitted to tests of ability in various mental operations, it was sought to ascertain how far the ability for any one of these operations tended to go with corresponding ability for the others. To estimate such correspondence there was available the great mathematical device of Galton, known as the "coefficient of correlation." This showed not only that the correlations had positive values, but that these values tended to fall into that peculiar arrangement which had received the name "hierarchy." There followed the further mathematical discovery that only when such a hierarchy occurred, each measurement for each ability of each individual could be divided into two factors, one being constant for all the abilities at issue, though largely varying as between one person and another. The other factor varied, not only from individual to individual, but also—at random—from one ability to another. These two factors had been designated, respectively, G (general ability) and S (special ability). G was a genuine faculty—i.e., one possessing functional unity. Dr. B. Hart had shown that G was just the factor which was predominantly influential in the pathological state known as amentia or dementia. Prof. Spearman pointed out, however, as a warning, that the ability to measure a person's G did not necessarily mean that the true nature of what was being measured was known. Evidently, then, the nature of the G was still the centre of a good deal of controversy. The first great advance in this matter of the psychology of individual differences was due to a very recent advance which had been made in general psychology. It had traced back the original genesis of all items of mental content to its source, and it had received the name "noegenesis." These noegenetic processes seemed to fall wholly and exhaustively into three sharply divided classes. The first could be formulated by saying that a person had, more or less, power to observe what went on in his own mind: he not only felt, he knew that he felt; he not only strove, but he was aware of the striving. The second of the processes was that when a person had in his mind two or more ideas he was able to bring to mind relations between them. In the third kind of process, when a person had in mind any idea together with a relation, he had, more or less, power to bring into mind the correlative idea. Prof. C. L. Burt had, he said, made a brilliant invention, the test of "analogies." For example:

Behind is to In front as Past is to ?
Black is to White as Clumsy is to ?

Here the "Black" and the "White" had to create in the person's mind the idea of oppositeness; and then this idea together with that of "Clumsy" had to evoke the correlative idea of "Skilful."

These three elementary processes entered into the structure of the mind much as certain types of cells made up the growing parts of the physical organism. There remained the thorny question as to how the G, which was a constant factor in all these noegenetic processes, could be conceived in physiological terms. To him, the most plausible suggestion so far was that it corresponded to some general psychophysical "energy" of the cortex, or some part of it, such energy being capable of being switched from one region to another. Many physiologists said they could not discover such energy, but their search had been in the periphery of the nervous system, where, indeed, the mental results showed it was not present. Those physiologists who dealt with the nervous system as a whole held a different view, for example Sherrington, who, writing in 1902, said: "One of the most helpful of the assumptions we can use in dealing with the problems of the nervous system is that which regards it as more or less a reservoir of energy." At present, however, this was no more than a working hypothesis. The G itself, however, together with its noegenetic character, seemed to be as firmly established as almost anything in science. The current methods of measuring it needed to be a good deal modified for psychiatrical purposes. The intelligence test of Binet, for instance, would be of but little service. One defect of this and similar tests was the dependence of the result not purely upon noegenetic power, but largely on previous education. A further defect was that it could not be used more than once. Psychiatric usage required that one should be able to measure the G repeatedly, as, for instance, in following up the state of a patient throughout some treatment.

The S's were the specific factors in ability: those which explained why and how far one person was better at doing one thing, and another person was better at doing another. Investigation of some of these S's had supplied Sir Henry Head with the foundation of his great work on aphasia. The physiological interpretation of these S's harmonised with and was demanded by what had been found for G, as no energy could exist without engines within which to work. If the cerebral cortex possessed a general energy, then the different parts of the cortical structure must supply the different engines. This was just what was required to explain the S's.

Perseveration.

The basis of this faculty, denoted by the letter P, lay in the familiar fact that mental effects tended to outlive their original causes. These left behind some residual excitement; after hearing a melody one might be haunted by it; when changing from one form of work, one might not be able for some time to dismiss the first subject from the mind. Had this any functional unity—i.e., was the person suffering most from haunting melodies likely to be he who experienced the greatest inertia in passing from one form of work to another? Did this residual excitement tend to go hand in hand with persistence of purpose? In general, the new experimental methods replied in the affirmative—i.e., that there did exist a functional unity, though not over persistence of purpose. One of the students at the College, Mr. Stephenson, had shown recently that an increase of perseveration was the most striking effect of imbibing alcohol; another student, Mr. Pinard, had found that the degree of perseveration in a child was a fundamental factor in rendering him "difficult" to handle. Thus, P was likely to be one of the chief diagnostic instruments in child clinics. It was necessary to remember, however, that part of what was usually attributed to perseveration consisted of an inhibited flow of ideas, a loss of "fluency." In manic and melancholic states these two seemed to be affected together, but in the normal state they seemed to vary independently.

Other Influential Factors in Cognition.

Flügel had discovered another unitary factor in cognition, that of *oscillation*. It consisted in the fact that the cognitive output of a person never persisted at a perfectly uniform level; it continually fluctuated up and down. On applying to this phenomenon the same mathematical technique as to G, it was found that here, too, the function was unitary—i.e., the person who presented the largest oscillation for one kind of mental operation also tended to have the largest oscillation for other kinds. This, represented by O, constituted, with G and P, a dominant triad. As to the importance of this O in states of mental disorder, this was, Prof. Spearman said, an almost virgin field of investigation, and it might bring forth results of unsuspected value. No other factor had so far been revealed which possessed such a width of range, but there were some broad enough to have great importance, perhaps particularly in mental disorders. A notable instance was the forming of mental "dispositions." On once folding a piece of paper, it would ever after be more easily foldable in this crease than elsewhere—i.e., it had acquired a disposition to fold in that place. It seemed that upon analogous dispositions depended all our remembrances, our stored-up knowledge and habits, and therefore most of our behaviour. The question arose whether this ability to form dispositions tended to accompany the previously mentioned other kind of retentiveness, perseveration. A further question was: Was this disposition-forming unitary within itself? Much information was being accumulated, but the research would be enormously advanced if the psychiatrists would collaborate. A further instance was conative control: What power had we over the course of our own ideas?

Psycho-analysis was a contribution of experimental psychology, and was, in fact, invented by Galton. Essentially, it was nothing more than associative reproduction freed so far as possible from conative control. It was abundantly explained elsewhere and was therefore not dealt with in this lecture.

Conation and Affection.

In the domain of striving and feeling, one came upon what was the more conspicuous in psychiatrical practice. Only in a small proportion of cases was a patient sent to a mental hospital, or even to a clinic, because of enfeeblement of his cognitive power; primarily he came for diagnosis and treatment because those about him could no longer tolerate his conation and affection. Here the ideal would be to test out the actual strength of each of a person's main conations, each spring of action or instinct. The conative side of mind had also been found to possess a general factor: it was such as to favour stability of resolution, evenness of temper, conscientiousness and trustworthiness, while it repressed vanity and selfishness. It seemed to be, in fact, a revival of the old-fashioned "Will," and was denoted by the letter W. It could not, however, be submitted to exact experimental measurement.

To carry out the collaboration required between experimental psychology and psychiatry, Prof. Spearman suggested that a carefully chosen group of patients be submitted to observation and measurement of every feasible kind; then the data could be arranged in an orderly and scientific system. It really meant the discovery of what goes with what and what follows what. On the answer to these two questions, in the last resort, depended all diagnosis, prognosis, and therapeutics.

MEDICO-LEGAL SOCIETY.

AT a meeting of this Society held on May 23rd the chair was taken by Sir WILLIAM WILLCOX, the President, who opened a discussion on

ACUTE ARSENICAL POISONING.

He said that improvements in technique and the extensive use of arsenic in the treatment of disease had added very greatly to our knowledge in the last seven years. Extremely minute quantities could be detected and measured and the clinical pathologist was now able to detect arsenic poisoning, almost without the help of the analyst, from the post-mortem appearances: acute swelling and degenerative changes in the kidney and liver and other organs, the condition of the gastro-intestinal tract, and the preservation of the blood and viscera. An inquiry in Sweden had shown that arsenic was present in the body of most normal people, and amounts of 1/100th of a milligramme per litre were to be found in the urine. The finding had been repeated in this country. Arsenic was a normal constituent of the urine, and the recent inquiry into ethyl petrol had shown that lead was also present in the majority of ordinary healthy people. Moreover, arsenic had recently been found in certain foods. The epidemic of poisoning from beer in 1900 had led to the appointment of a Royal Commission, which had fixed a legal limit for the amount of arsenic a foodstuff might contain: 1/100th of a grain per pound or gallon. Since this time there had been few cases of arsenic poisoning from food. Some kinds of fish, however, contained much more arsenic than the legal limit— for instance, sole contained 1/10th of a mg. in 100 g. This arsenic was probably not arsinous acid but some organic compound; it might, however, easily arouse the suspicions of a toxicologist. Crustacea, oysters, and other shell-fish contained 20 to 40 parts per million of arsenic, and the poison had also been found on apples as the result of spraying the trees.

Mrs. Llewellyn, a woman of 63, had died after a period of indifferent health during which she had suffered from arthritis, dilated heart, renal disease and ascites, and attacks of diarrhœa and vomiting. She had been a second wife and there had been jealousy between the two families. Two months before her death an examination of the urine had revealed the presence of 0·6 mg. of arsenic per litre—i.e., the maximum normal limit. She had been very partial to fish. After her death 0·4 parts per million of arsenic had been found in the heart and liver, 0·8 in the kidney, and two parts in the hair. The presence of arsenic in the hair had indicated that she had been taking it for a long period, and the fact that only a very small amount (0·06 parts per million) had been found in the ascitic fluid had negatived the possibility of a fatal dose of arsenic causing the symptoms in the last days of life.

Arsenic had been chosen as a homicidal poison since time immemorial, as it was tasteless and fatal in very small amounts, and the symptoms it caused closely resembled those of organic disease. It should not be described as an irritant poison, for its irritant effects were by no means the whole danger. Arsenic was a tissue poison and poisoned all the organs of the body, causing rapid pulse and heart failure, jaundice, albuminuria and casts, and the patient who recovered from the diarrhœa and vomiting was by no means out of the wood; he might be damaged for life. The after-effects were regarded far too lightly.

In the Pace case the victim had evidently had one dose of arsenic to cause the acute diarrhœa and vomiting which had set in on July 24th, and at least one or two more doses to cause the vomiting to continue until August 10th; he had then gone into the infirmary with peripheral neuritis and had returned home improved in general health. He must then have had another dose to cause diarrhœa, vomiting and collapse on Christmas Day, and at least two more to induce another attack five days later and the third fatal one. So altogether he must have had five fatal doses, and enormous quantities had been found post mortem. The arsenic had probably been obtained from sheep dip, which contained 20 per cent. of it. The suggestion had been made that it had been taken with potassium permanganate, but examination of the organs for manganese had shown no more than the normal amounts, so that this suggestion had been negatived.

Prof WALKER HALL described some experiments he had made on the

Action of Sheep Dip on Tissues.

Sheep dip, he said, was easily obtained, in sealed packets in the form of a yellow granular powder, by anyone known to have the care of sheep. It consisted of arsenic trioxide, sodium carbonate, and ground sulphur, and a packet contained about 2850 grains of arsenical components, or 1400 minimum fatal doses. When prepared according to the directions it yielded a 0·2 per cent. solution of arsenic trioxide in sodium dihydrogen arsenate. The toxicity of this was about half what it would be without alkali. There was very little danger in handling the solution and cutaneous absorption was a bogy. He had rubbed the dry dip on his hand and soaked the hand in the solution without experiencing any symptoms, or finding any excess of arsenic in the urine. Sheep dip in solution could be easily mixed with food or drink, but it was very difficult to take in powder form because of the sulphur.

Single and repeated doses of sheep-dip solution had been given to rabbits, which had been killed in 6, 12, 24, and 48 hours. The doses had been equivalent to about 7 g. for a human being—a quantity often exceeded by the suicide or poisoner. Within six hours 95 per cent. of the arsenic had been absorbed, and by 12 hours 9·8 per cent. had disappeared from the stomach and intestines. When the solution was given without being freed from the sulphur the yellow granules all passed from the colon within 24 hours, without loss. Six hours after a single dose minute hæmorrhages had taken place in the gastric mucosa, and these were more numerous after 12 and 24 hours, or after similar repeated doses. The stomach wall was gradually and progressively contracted and after 12 to 24 hours the viscus was hard and tense. This contraction was more pronounced with repeated doses. Hæmorrhages did not appear in the intestines until after 12 hours, but were widespread after 24 hours, and with repeated doses were more generalised. The arsenic did not produce contractions in the small intestine, perhaps because nearly all of it was absorbed through the stomach. Hæmorrhages did not appear in the colon until after 24 hours and were not more marked with repeated doses. The cells of the liver were less distinctly outlined after 12 hours and the cytoplasmic structures stained more diffusely. The nuclei showed altered chromatin; Kupfer's cells were beginning to swell and their nuclei were more granular than usual, but the bile channels were unaltered. After 24 hours the liver cells showed signs of serious damage, the outlines were indistinct, vacuoles were numerous; early fatty changes were evident; nuclei were necrosing; œdema and passive hyperæmia were general; Kupfer's cells were swollen and proliferating; and the duct cells were swollen. With repeated smaller doses these features were less advanced, but the Kupfer's cells showed a greater activity and many mononuclear and polynuclear cells were present in the dilated sinusoids. Myocardial cells, 6 to 12 hours after the fatal dose, showed little or no change in the striæ or nuclear appearance. At 24 hours some of the cells showed defective striation and nuclear changes; others had lost their staining capacity and appeared to be necrosing. With repeated doses there was œdema and proliferation of interstitial cells; the myocardial cells had lost their striæ and were becoming granular. The morbid appearances of the other organs at this period were mainly those of capillary damage, passive hyperæmia, œdema, and hæmorrhages. After six hours the blood-vessels were almost unaltered, but after 12 hours there were many dilated capillaries and some diapedesis; the appearance became more marked after 12 hours and with repeated doses. The renal vessels did not show much change until 24 hours.

Discussion.

Dr. J. H. RYFFEL mentioned the variations of toxicity of arsenic in different foods. It was apparently more poisonous in beer than in fish; possibly there was some noxious association between arsenic and alcohol. One form of acute arsenical poisoning was caused by arseniuretted hydrogen, which might be produced in large quantities by the action of acids on impure zinc—e.g., glass. It caused the patient to turn a copper colour, due to a mixture of hæmolysis and jaundice. The latter was a special feature of poisoning from this form of arsenic. The lævulose test was a fairly satisfactory one for demonstrating the damage done to the liver.

Mr. EDWARD HINCKS described the various chemical methods for detecting and estimating arsenic. The mirror method was very simple in principle, but far from simple in practice. The organic material in the arsenic component must all be destroyed and hydrogen must be developed on the surface. To avoid the risk of pockets of arsenic in zinc, electrolytic processes had been devised to elaborate the hydrogen. Theoretically they were ideal, but the platinum cathode had proved rather insensitive, lead was very sensitive but had to be renewed frequently, and on the whole the most successful was a liquid mercury cathode in which a new surface could be obtained by tapping. Mr. Hincks handed round mirrors showing how quantities from one to nine millionths of a gramme could be detected by the latest modification of the Marsh test, which he regarded as the safest and most satisfactory method for the toxicologist. The mirrors could be kept permanently in hydrogen, or could be sublimed into arsenious oxide, to which chemical tests could be applied. Antimony and selenium could be distinguished from arsenic with certainty. The objection to the mirror method was that it depended on visual judgment, and although hundredths of a milligramme could be weighed on a micro-balance this would not necessarily bring the result much nearer the truth. The method was subject to a percentage error of ±10, which was lamentably great. It was therefore better to use an ordinary gravimetric method where concentration of arsenic was high. In surgical terms the detection of arsenic remained "a major operation."

Mr. H. E. COX, in answer to a question, said that there was no spectroscopic test for arsenic. The lines were all in the extreme ultra-violet, where they could not be seen. The work of the Swedish Commission was worthy of intensive study, as the amount of arsenic found in the normal human body was still grossly underestimated. He emphasised the difference between organic arsenic combined with proteins as in fish, which was non-toxic, and the added arsenic, which was very dangerous.

Mr. K. B. EDWARDS pointed out that no cases of arsenical poisoning had occurred as a result of using fruit-tree spray for destroying disease in trees. He asked whether it was really an arsenical poisoning.

Prof. WALKER HALL, in reply, pointed out the peculiarly selective action of arsenic, both for tissues and individuals; and Sir WILLIAM WILLCOX said that, so far as he knew, no case of poisoning from apple-tree spray had occurred; the arsenic had been detected in the course of routine food and drug analysis.

Corrigendum.—In Dr. Graham Forbes's remarks at the R.S.M. Section of Tropical Medicine (THE LANCET, May 25th, p. 1094) for dysentery read *diphtheria.*

ROYAL INSTITUTE OF PUBLIC HEALTH.

WHITSUNTIDE MEETING AT ZÜRICH.

THE annual congress of the Institute, held at Zürich from May 16th–20th, afforded, as we noted last week, excellent opportunities of obtaining direct information on medical problems peculiar to Alpine countries and on the state of the Swiss public health. In the sectional meetings the broad international aspects of health and disease were uppermost.

In the Section of State Medicine a discussion on

Rheumatism as an International Problem

was opened by Dr. J. VAN BREEMEN (honorary secretary of the International Committee on Rheumatism, Amsterdam), who, while agreeing that at present it was impossible to adopt a uniform international nomenclature to distinguish the diseases comprised under the heading of rheumatism, held that much benefit would be derived from the organised study of four factors: focal infections, the rheumatic diathesis, abnormalities in the blood circulation of the skin, and the effect of environment. He presented a series of rheumatic cases of various types in all of which the skin temperature was low; a special instrument for taking the temperature was demonstrated. Attention was called to the value of physical therapy in spite of the presence of considerable abnormality of structure. Early treatment *must* be secured; in the Rhine Provinces any contributor to a sick fund who has suffered from rheumatism for some months must be sent for examination to a supervisory medical officer who, if necessary, sends the patient to the Landesbad. Dr. Breeman suggests a methodical investigation of the causes of rheumatism in miners, taking especially into consideration the dampness of the mine and the character of machines used.

Dr. WARREN CROWE (London) showed lantern slides illustrating early osteo-arthritic changes produced in rabbits by the injection of certain varieties of streptococci derived from the roots of infected teeth; their action was greatly enhanced by the presence of a focus of infection artificially produced by the subcutaneous injection of infected agar. Dr. Crowe pointed out the general applicability of specific vaccine treatment; stock vaccines of a sufficiently polyvalent character hold out great promise.

The paper of Prof. CMUNT (Prague) dealt with the promising results obtained by using the cutaneous vaccine treatment introduced by Paul of Vienna; 836 patients had been vaccinated, most of whom were given no other treatment. The use of cuti vaccine had the advantage of detecting focal infections such as dental sepsis and appendicitis, which could at once be treated radically.

The Slum Problem.

Mr. B. S. TOWNROE (Hampstead) pointed out that in Great Britain the "unhealthy area" or "slum" is defined by the Housing Act of 1925; a more descriptive definition is to be found in the writings of Sir George Duckworth. Unhealthy areas might consist of property which was structurally sound, and therefore worthy of complete repair; the repair could be effected by local authorities, voluntary associations, or by private landlords. Some areas consisted of property which was almost worn out but which, owing to the absence of alternative accommodation at a rent that the occupants could pay, had to be reconditioned to last for a further temporary period. The present problem is to so reduce the cost of building that the dwellers in such areas could afford to occupy new houses. State subsidies, he held, inflated building costs, created a class of municipal tenant whose rents were dependent upon the votes of popularly elected municipal councillors, and encouraged pauperisation. Subsidies can only be defended as temporary expedients but are still needed for slum clearances.

Councillor E. D. SIMON (ex-Lord Mayor, Manchester) pointed out that post-war housing legislation for the poorest class of workers was eminently unsatisfactoy. Even the Wheatley subsidy, which was designed to allow houses to be let at restricted rents, has not brought new houses within the reach of the large poor family. The minimum rent at which non-parlour houses with three bedrooms can be let by local authorities is 11*s.* a week inclusive of rates. The labourer with three or more dependent children needs a house at not more than 8*s.* a week. To bridge the gap between the rent of the Wheatley house and what the labourer can afford, Mr. Simon suggests a "children's rent allowance" to be made in the form of a rebate in the rent, but only in the case of those families who could not otherwise remove from the slums into a decent house. If this rebate were 1*s. per child each week in the case of all families* whose income is less than 60*s.* a week, and who have three or more children, the cost would only amount to the relatively small sum of five million pounds a year.

Prof. BERNOUILLI (Zürich) regretted that by withdrawal of the Government subsidy building societies in Switzerland had been thrown back on to their own resources; the erection of houses intended for a single family had almost entirely stopped. The result will be that speculative builders will step in and erect the less hygienic type of house—the apartment house—which costs less to build and, at the same time, produces a higher rent.

Health Propaganda.

The paper of Prof. H. HUNZIKER (Basle) gave an insight into the stage of development of school medical work in Switzerland with its 25 autonomous Cantons. In addition to the large towns 300 out of 3000 communes possess a school doctor. The new Federal tuberculosis legislation requires the regular medical supervision of teachers and children in schools and similar institutions. School nurses are employed apparently more in the French-speaking part of the Republic than elsewhere—in Lausanne there is a school nurse for each school district. Instruction in hygiene is given in a verbal form by the school teachers chiefly, but from the very beginning school doctors have done excellent work by giving teaching on such special subjects as the prevention of goitre, infestation by intestinal worms, dental decay, and alcoholism. Instruction on sex and the dangers of venereal disease is given at the end of the child's school life by a doctor; in the case of girls by a woman doctor. Dr Hunziker considered that the teaching of infant welfare in schools had brought about the very low infantile mortality (35–45) in Basle, Zürich, and Berne. University extension courses in hygiene were well attended in Switzerland.

Dr. HÄBERLIN (Zürich) gave an account of his five years' experience of writing popular health articles in the lay press. Appreciation had been expressed in the shape of letters and verbally; that interest had been aroused was shown by the large number of questions asked. Numbers of the newspaper containing the articles on hygiene had a larger sale than the others. He was convinced that the ordinary newspaper was a much better vehicle of propaganda than a special health propaganda periodical. The variety of the subjects dealt with was evidently very great; they included the dangers of the use in common of a glass for drinking; the hygienic value of the lake of Zürich; warm or cold baths; douche or bath. Advice as to the recognition and self-treatment of diseases was rigorously excluded.

Dr. J. J. **Paterson** (East Berks) regretted the ephemeral character of such articles, and suggested that book form was almost essential.—Dr. W. E. S. **Finny** stated that it was the duty of the Kingston-upon-Thames public librarian to collect such articles and paste them in a book which was available for the public.—Mr. C. M. **Kohan** (London) thought that even health publicity, which was entirely satisfactory, does actually create in a by no means small proportion of the laity an idea that they can diagnose and treat their own complaints or hypochrondria. The point of contact of health propaganda with commercial enterprise which can give actuality to health principles and commercial exploitation which seeks to enlist the enthusiasm of a pioneer movement for its own ends, must be clearly watched.—Col. P. **Draudt** (League of Red Cross Societies) pointed out as an example of the extent of its preventive work that in 12 countries alone the Red Cross had provided 568 tuberculosis dispensaries, 53 sanatoria, 115 preventoria, and 281 colonies. In India a large number of brochures and pictorial posters had been distributed. The Japanese Red Cross had got together a popular hygienic museum which was a model. In some parts of the world children with their own money, often gained by work, had contributed towards playgrounds and holiday camps for their weaker brethren.

Alcoholism as an International Problem.

Dr. **Hercod** (Director of the International Bureau against Alcoholism, Lausanne) referred to the strong pressure put by the liquor trade on such prohibition or partial prohibition countries as Iceland and Norway by nations such as Spain, Portugal, and France, who desired to export wine and spirits. In spite of the efforts made to control the export of spirits to Central Africa, notably the Convention of Saint German-en-Laye concluded between several colonial powers for the purpose, only moderate success has been attained. Smuggling of liquor is not confined to America—it is going on all around the Baltic Sea; Finland, Norway, Sweden, and Denmark have jointly concluded the Helsingfors Convention with States from which spirits are brought into their territory. In accordance with a resolution passed by the League of Nations Assembly, the Health Organisation is collecting statistical information on alcoholism, giving prominence to the effect of alcohol of "bad quality," and the Economic Committee is considering the adoption of some international measures against the smuggling of liquor; wine, beer, and cider are expressly exempted from consideration by the terms of the resolution.

Industrial Hygiene.

In a paper on occupational dermatoses Dr. **Prosser White** (Wigan) laid down certain conclusions. In a person artificially or accidentally sensitised to a foreign protein, a minimal quantity will excite a reaction This reaction may be more severe, extensive, and lasting than in a non-allergic individual. In trade processes this form of acquired protein sensitisation is rarely encountered. Acquired or true protein sensitisation eruptions do not last indefinitely nor does a fresh exacerbation break out in the absence of a fresh contact with the allergen. Sensitiveness to the different vegetable and inorganic chemicals is generally an inborn quality of the skin; this anomaly of development is elicited by vegetable products. The specific agents which cause skin cancer bring about the cutaneous changes, whether applied locally or inhaled or ingested. The halogen acnes are probably always an "excretion dermatosis." True sensitisation plays no part in the eruptions caused by the inorganic irritants. Given proper treatment and absence of the irritating agent, occupational eruptions, allergic or otherwise, with the exception of those caused by substances such as arsenic, tar, oils, &c., which produce deferred effects, heal up as rapidly and in as short a time as any other sore or injury of equal extent and severity. Absence of healing means that we are dealing with an internally produced skin trouble such as eczema, seborrhœa, or a mycosis and not a traumatic skin disease. Until medical referees recognise these facts when dealing with occupational affections of the skin their verdict cannot be "succinct, definite and categorical," or "just to both sides." The first three requirements are laid down by Judge Sands as essential in any certificate issued by a medical referee. Given a reasonable period of freedom from any chance of exposure to an irritant an inflammatory, periodic (recurrent) affection of the skin, characterised first by erythema, papules and vesicles, and later by scaly, weeping, or crusted patches associated with itching or burning and with indefinite or irregular edges is a "diathetic skin disease"; it should not be called a "dermatitis," much less a "trade dermatitis." Such cases should be periodically re-investigated by an expert experienced in the recognition of both the endogenous and exogenous skin eruptions.

Dr. G. **Quin Lennane**, at the Battersea Tuberculosis Dispensary, recently dealt with several cases forming part of a group of patients suffering from silicosis contracted in a local factory, the diagnosis of which was not made until the post-mortem examination. The "factory" only employed about 15 girls who were all engaged in making scouring powder—seven fatalities occurred; only two had tuberculous lesions. Dr. Lennane held that unless more inspection was carried out by the Home Office the duty should be handed over to the local health authority, which, indeed, was the appropriate authority to undertake such inspection.

Dr. G. A. **Haydock** (York) had found that young girls employed at Messrs. Rowntree's works, who had suffered from acute rheumatism, were not suitable for collective piece employment, but that they could maintain an average output if given work in which they could be allowed to adopt their own extremely irregular rhythm which, he considered, was the result of rheumatism rather than an anxiety neurosis.

Prof. F. **Schoofs** (Liége) referred to accidents occurring to workmen who entered tanks where ordinary motor spirit is stored. Exhaust gas from motors may contain as much as 10 per cent. of carbon monoxide. If the engine is allowed to run for a considerable time in a closed garage the exhaust gases, which also contain unburnt volatile hydrocarbons may cause unconsciousness followed by severe headache or even death. In a fatal case carbon monoxide was found in the blood.

Health of the Swiss Army.

Colonel **Hauser**, M.D. (Chief Medical Officer of the Swiss Army), explained the measures adopted in the recruitment and conservation of the health of the Swiss Army, in which all able-bodied men are required to serve seven weeks during their first year as a recruit and subsequently twelve days yearly for seven years. A travelling medical board tours the various centres to examine the young men; especial attention is paid to the detection of tuberculosis, X rays being used wherever possible. Much reliance is placed on the sprinting test which serves to detect not only heart and lung trouble and flat-foot, but also nasal defects and kidney lesions. Valuable statistical material relating to goitre is obtained; owing to its wide spread men with slighter degrees of the disease must be accepted for service during which iodine in small doses is administered. Shortly after recruitment the men are vaccinated against small-pox; all the more necessary because in several of the Swiss Cantons there is no compulsory vaccination

Dental work is carried out; prophylactic gargling is compulsory. Men who have run the risk of infection with venereal disease undergo prophylactic treatment. Care of the feet is taught; before joining up the men are given the Army formalin foot powder "Arfol"; a 5 per cent. paint of formalin in alcohol is also used. To prevent trouble consequent on riding, the seat and inner side of the thighs are painted with a weaker solution (2 per cent.).

Tuberculosis.

Much interest was taken in the Swiss University Sanatorium established at Leysin. Each university and technical high school student pays 10 francs a year as part of his or her fees towards the University Insurance Fund and each member of the teaching staff 20 francs. If a student or teacher contracts tuberculosis he is treated at the sanatorium at a charge of 36*s.* a week. The patients are given facilities to continue their studies in a less intensive form; the Swiss universities allow a year spent at the sanatorium to count as a term. Students from non-Swiss universities are admitted, as far as space allows, at a rate of about 10*s* a day; it is hoped that the accommodation for these foreign students will be extended. At Leysin Dr. Rollier, in the treatment of surgical tuberculosis combines heliotherapy with occupation therapy which, however, must be under constant medical supervision. A case of Pott's disease is able to work without any difficulty in the ventral position, of hip disease in the dorsal position. For tuberculosis of the upper limb machines for the one armed are used. An International Factory Clinic has been established for the poorer class; using electrically driven machinery and special tools, the patients make the small parts of machines and spare parts of watches; commercial studies are also made.

Dr. R. C. **Wingfield** (Frimley) considered that the absence of adequate arrangements for after-care of patients treated in sanatoria constituted a serious weakness of English tuberculosis schemes.

Dr. **Otto Amrein** (Arosa) pointed out that in order for the tuberculous to benefit by treatment at high altitudes a certain measure of resistance must be present. An increase in the number of crepitations sometimes occurs as the result of increased altitude. A rise of temperature is due at times to syphilis or malaria. The presence of fever, he held, did not contra-indicate the journey to high altitudes, but patients with a temperature of above 101·5° F. with a pulse-rate of 120 or higher not responding to complete rest in bed are not suitable for high altitudes. Other contra-indications include obstinate dry pleurisy and usually both abdominal and urogenital tuberculosis. Where an artificial pneumothorax has been made on return to lower altitudes more frequent refills are necessary. Patients from northern countries should not visit places with a relaxing climate on the way home. English patients ought not to return home before the end of May.

The paper of Dr. F. **Haeberlin** (Davos) dealt with adjuvants to artificial pneumothorax treatment. X rays and thorascopic inspection enable the physician to decide as to the possibility of dividing pleural adhesions endoscopically using the electric cautery. Pleural adhesion affecting large areas may possibly be counteracted by filling the pleural cavity with oil.

Climatology.

Prof. **Walter Hess** (Zürich) gave a short account of the work carried out at the different Swiss Alpine research institutes—Monte Rosa with its two allied institutes, Campana Regina Margherita and Angelo Mosso; at the Davos Institute with its two sections, one at Muottas Muraigl, the other at Gornergrat, where investigations are being made as to the biological value of the Alpine climate in relation to tuberculosis; at Arosa, where the utility of ultra-violet light is studied, and Dr. Gotz, the director, is also collaborating in the ozone investigation association organised by Dr. Dabron Oxford, and finally, the High Alpine Research Station on the Jungfraujoch which, it is hoped, will receive international support.

Prof. **Senn** (Basle) attributed the increased metabolism at high Alpine climates to the increased permeability of the protoplasm in strong light.

Dr. F. **Lindholm** (Davos) referred to the improved climatological table brought out by van Oordt and Dorno, which, in addition to data relating to the mean daily fluctuations of temperature, gives information as to the frequency of interdiurnal changes and the dates on which the daily mean temperatures reach 10° for the first time, these events corresponding approximately to the phænological beginning of spring and autumn. Investigations have shown that the temperature of the air and its cooling power do not stand in close relation. The north European coast stations have the highest and the tropics the lowest cooling power; the sheltered mountain valley of Davos stands almost midway, and like the tropics exhibits the least seasonal fluctuations. Dr. Lindholm suggested that records of the cooling power of the air might eventually afford useful information in connexion with the occurrence of epidemics. He pointed out that our climatological knowledge of radiation, whether of the sun, sky, or earth, although of extreme climato-physiological importance was still very scanty. At Davos, investigations have shown that the essential characteristics of the radiation of high altitudes as compared with low include an increase of short waved and especially ultra-violet radiation and a greater uniformity of the total intensity both in the course of the day and the year. The diminished quantity of ozone present is held to play some part in these phenomenon.

In the Section of Pathology, Bacteriology, and Biochemistry, Prof. **Karl Wegelin** (Berne) read a paper on

Endemic Goitre,

pointing out the special characters of the disease in Switzerland. There is, he said, an early epithelial hyperplasia not seen in the milder form found in Holland, Norway, and North America. Primary exophthalmic goitre is rare in Switzerland; a diminution of thyroid secretion is the usual condition. The proliferation of the epithelium occurs in fœtal life; in the child a diffuse parenchymatous goitre is seen from which usually at the age of puberty either a diffuse colloid goitre develops or an adenoma. Malignant growth in old adenomata is by no means rare. The relative and often the absolute iodine content of the goitrous thyroid is diminished, but probably the condition is not entirely due to the lack of iodine in the environment and aliment; in Switzerland goitre is unknown in wild animals; in other countries when the disease is endemic an adequate amount of iodine is available. The prophylaxis of endemic goitre must begin in the fœtal stage of life; sufficient iodine must be given to the mother throughout pregnancy. Later, preventive measures consist in administering iodized salt and giving tablets of iodide of potassium or sodium during school age. The fact that ossification is always very late or even absent in certain centres in cretinism was well brought out by lantern slides.

Typhoid and Paratyphoid.

Prof. W. J. **Wilson** (Belfast) referred to the extent to which paratyphoid had replaced typhoid infections in the British Isles; the experience of Dr. J. E. McCartney (M.A.B.) was that typhoid fever had become so uncommon that cases were not recognised so early as formerly; he considered that when any obscure infection was noted the laboratory worker should be called in immediately to see the patient clinically and to decide what specimens should be obtained to establish a diagnosis.

Meat Inspection.

Lieut.-Colonel T. **Dunlop Young** (City of London), speaking on imported meat, said that formerly, owing to the scarcity of beef, mutton, and pork in Great

Britain, live animals were brought from the Continent; those were at first allowed to be sent to, and sold at markets throughout the country, but it was observed that contagious diseases were introduced by them and then they had to be killed at the ports of landing. Later, owing to the introduction of refrigeration of meat, meat was brought from the U.S.A., Argentina, Australia, and New Zealand. Gradually the livestock trade ceased until at present there is practically no importation of livestock. As the demand for imported beef, mutton, and pork increased, it was observed that the carcasses of the best types of animals sold at highest prices; this was pointed out to the breeders and feeders in the various exporting countries, with the result that Great Britain became the pedigree stock farm of the world from which the best types of animals have been exported to the U.S.A., South America, Canada, Africa, Australia, and New Zealand.

Prof. A. **Krupski** (Zürich), giving an account of meat inspection in Switzerland, said that fattened beasts and meat and meat products imported into Switzerland must be inspected at the frontier by special veterinary officials.

Bovine Tuberculosis.

Dr. H. **Baer** (Zürich), giving his experience of the immunisation against bovine tuberculosis with B.C.G. and Friedmann vaccines carried out in the Canton of Zürich since 1924, said that the Friedmann vaccine has caused neither local nor general disease; the course of the disease was not influenced unfavourably. The post-mortem examinations, however, do not show any certain therapeutic or protective effect produced by the Friedmann vaccine. The B.C.G. vaccine does not cause any disturbances of the general condition of the animals although some developed permanent swellings at the place of injection. The results of the clinical examinations of bovines revaccinated two to three times seem to demonstrate a certain increase of resistance against tuberculous infection; the number of port-mortem examinations made were, however, too small yet to warrant a definite conclusion.

The paper of Lieut.-Colonel J. W. **Brittlebank** (Manchester), on tuberculosis among bovines, expressed his view that the grading of milk failed to contribute in any appreciable degree to the diminution in the extent of the disease. In England those districts which have been concerned with dairying as their principal branch of agriculture for the longest period have amongst their cows the highest incidence of tuberculosis. He believed a widespread policy of reconstruction of farm building to be essential; this could be spread over a number of years; Government loans should be available. Efforts should be concentrated on the dairy cow. Routine clinical examinations of all dairy stock should be made by veterinary surgeons to detect cases of open tuberculosis; the tuberculin test detected in many instances the presence of á tuberculous lesion which had no public health significance.

Milk.

Reference was made by Drs. J. B. **Orr** and **Gerald Leighton** to the Scottish milk-feeding investigation in schools. Dealing with 1282 public elementary schoolchildren in 1927 and 1157 in 1928, the results showed that the group given whole or separated milk daily in seven months grew ¼ inch taller, and from ¾ lb. to 1 lb. heavier than the children who received no milk. A somewhat surprising result was that practically the same increase occurred with separated milk as with whole milk.

Dr. H. E. **Magee** (Aberdeen), speaking on some effects of heat, said that physico-chemical examination showed that, of the total calcium 26 per cent. is in diffusible form in raw milk; 20 per cent. in milk heated to 70° for 30 minutes, and 15 per cent. in milk boiled for an hour. It is believed that the differences are due to the formation of colloidal $Ca_3 (PO_4)_2$ which explains the rise in calcium noted. Heat lessened the stability of the colloids. In balance experiments with growing animals retention of Ca, P, and N was greater in the case of sour and raw milk than in heated milk. Addition of soluble calcium to the heated milk increased the retention of these elements. In feeding experiments with calves fed on cow's milk, the animals receiving fresh milk throve better than the control groups receiving pasteurised milk. The addition of soluble calcium to pasteurised milk removed the detrimental effect of the heating. Heat caused the disappearance by volatilisation of 20 per cent. or more, according to the duration of the heating, of the total iodine of milk. The ratio of diffusible to non-diffusible iodine was the same in raw as in heated milk. Approximately 83 per cent. of the total iodine of separated cow's and goat's milk was found to be in diffusible form.

Reviews and Notices of Books.

THE SCIENCES AND PHILOSOPHY.

Gifford Lectures, University of Glasgow, 1927 and 1928. By J. S. Haldane, C.H., M.D., F.R.S. London: Hodder and Stoughton. 1929. Pp. 344. 15*s.*

The ignorant reader would be glad if each volume of Gifford lectures which is published contained some account of the origin and purpose of a foundation which has produced so many noble contributions to natural theology. Dr. Haldane's book is a notable number of a distinguished series. Anything which he writes will be attentively received by those who know what he has done for the advancement of physiology and medicine, partly by way of exact experiment (which is not uncommon), partly by way of rigorous thinking (which is rare). What he has to say on philosophy has at any rate this appealing quality, that it comes from one who has a lifelong practical familiarity with experimental science. There need, however, be no draft on our respect and affection for an appreciation of this statement of his mature views on the philosophy of the natural sciences. The book obviously stands on its own merits, and it may be said at once that most of it at any rate is within the tolerably easy understanding of those who have not enjoyed the advantages of a Scottish education in philosophy. There are, he says, four kinds of knowledge, that is four sciences: mathematical, physical, biological, and psychological. Each of them is in its way an interpretation of our experience of the world, but they seem in many ways to contradict one another. If we hold by one kind of interpretation, we obviously leave out some of our experience and our view is incomplete; if we hold by them all, we include all our experience but our view is incoherent. What is the solution? Mathematics deals with ideal abstractions which plainly have little to do with reality. The physical sciences give a self-contained interpretation which, as physicists themselves have come to realise, is necessarily incomplete because it cannot embrace large and prominent facts of experience. Biology does not think of reality as a series of independent bodies, but as a unity which includes both organism and environment, and in which structure and activity are mutually dependent. None of these ways of looking at the world gives us a satisfying picture. Psychological knowledge, on the other hand, deals with interest and values which extend into the past and into the future and are beyond space and time relations. Mathematics, physics, and biology represent our imperfect attempts to bring these spiritual values into an objective form which we can apprehend. The only final reality is the universe of spiritual interest and values, which is what the language of religion calls God.

Few of those who read Haldane and Priestley's classical paper (*Jour. Physiol.*, 1905, xxxii., 225) will have imagined that this would be the final conclusion deduced from the study of human respiration.

But one of his audience in Glasgow said when she got home: "I thought he was going to talk about God, but he talked about nothing but kidneys"—an unconscious tribute to the fundamental nature of Dr. Haldane's philosophy.

HISTORICAL INTRODUCTION TO MODERN PSYCHOLOGY.

By GARDNER MURPHY, Ph.D., Instructor in Psychology, Columbia University. London: Kegan Paul, Trench, Trübner and Co., Ltd. Library of Psychology and Scientific Method. 1929. Pp. 470. 21s.

THE respectability of psychology has been doubted on the one side by philosophers, who grant it no independence, and on the other side by those scientists, particularly the physiologists, who state that its data are only positive when stated in terms of neurology, and have no definite significance when expressed in the vocabulary of mind. Both these views are false, and Dr. Murphy's scholarly survey of the evolution of psychology from the fourteenth century does a great service in exposing their fallacy and in showing the importance of this branch of human study. Quite apart from the illustrious names that are scattered through its pages, the survey shows to what extent the sciences of physiology and biology are indebted to those who were primarily concerned with the study of the senses and the elementary processes of the mind. The early chapters of the book deal with the background of the science and with the fundamental discoveries and theories that have given direction and a bias to its methods. Most important are the sections which bridge the gap between the purely introspective psychology of the late eighteenth centuries and the psychology of our own day, derived from the laboratory, and from the field of psychopathology and of education. This period was occupied by the pioneer work of W. C. Weber, later of Wilhelm Wundt, and behind lay the background of the great English and Scottish thinkers, such as Bain, Reid, and Hamilton. Later came the theory of evolution and the advent of the biological standpoint. In the third part of the work the various aspects of modern psychology receive attention. In a book which attempts to deal justly with all developments of psychology in 500 pages space must be allotted with a sparing hand, but it is unfortunate that only a chapter could be devoted to the "enfant terrible" of psychology—psycho-analysis, since recent views in this particular branch are not adequately discussed. Dr. H. Kluver has added two full chapters on contemporary German psychology.

The whole book is well written, and though many names and many works have escaped consideration, few important contributions to modern psychology have been altogether ignored. As a general introduction to the subject it should be appreciated by students in all faculties as well as by the individual whose interest in the development of our knowledge of psychology is quite apart from academic studies.

THE MEDICAL DEPARTMENT OF THE U.S. ARMY IN THE WORLD WAR.

Vol. IV.: *Mobilisation Camps and Ports of Embarkation.* Washington, D.C.: U.S. Government Printing Office. 1928. Pp. 494. $1.75.

THE minute detail set out here is of great value; the inclusion of a brief standard programme for a future mobilisation, if this should ever be required, would have been welcome, since the story shows that a slight misdirection of effort involved a laborious recovery involving much loss of time. This volume discusses the preparation of camps for the training of soldiers, the conveyance of the army to Europe, and its return home. The sites for the camps had to be selected, they had then to be planned and built, which meant the collecting, feeding, housing, and doctoring of perhaps 14,000 labourers, not under military discipline, for a couple of months; there followed the administration of a divisional camp for some 35,000 soldiers, with their conveyance, free from infectious disease, on healthy transports to Europe. Just as the organisation had got into its stride came the armistice, when the army with all its sick and wounded began to pour back, all so eager to get to their homes that no excuse would be accepted for delay. Yet no infectious disease could be allowed to slip through, and no one patient was to be sent home feeling that he had not had proper attention. So the Hoboken Embarkation Camp, which began with two medical officers and ultimately employed a thousand, passed 1,160,534 men through to Europe, examining 1,767,624 men, detaining 9812; it was the rule for each man to be examined on the actual day of sailing. One group of 26,000 were examined daily for six days, owing to delayed departure of the ship.

Points of general interest are as follows. One man was "issued with" a shaving-brush he did not use for 18 months; yet even after that delay it seems to have given him anthrax. Tetanus bacilli were found in one of 498 samples of surgical catgut. The U.S. Army Medical Department includes the Veterinary Corps, so horse ships are discussed. In this connexion we read: "The most common cause of death (of horses aboard ship) was pneumonia. It occurred . . . in the remote corners of the animal compartment where the ventilation was not functioning properly." That is evidence that must not be forgotten when the relation of pneumonia to ventilation in barracks is considered. A full account is given of a social hygiene campaign around the Embarkation Camp at Newport News, and of its result in limiting venereal diseases as long as the war was on; after the armistice things fell back rather into the old ways for want of active popular support. The feeding of the invalids returning on hospital trains was not satisfactory until entrusted to coloured cooks loaned by the Pullman Company; and the use of paper cups and dishes on these trains permitted a reduction of staffs. For the benefit of junior medical officers in future it may be mentioned that the routine examination of men proceeding overseas included: hair for lice; eyes for inflammation; nose and throat for exudates; chest, back, and abdomen for rashes; also venereal inspection. It is noted that latent chronic gleet could often be detected immediately after a two-hour march with no opportunity for micturition, and that gonorrhœa was simulated by malingerers with the aid of condensed milk.

The book is a record of assiduous, successful work, reflecting credit on its compiler.

THE HISTORY OF BIOLOGY.

By E. NORDENSKIÖLD. Translated from the Swedish by L. B. EYRE. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1929. Pp. 629. With 32 portraits. 25s.

BASED on a course of lectures given at the University of Helsingfors in 1916–17, this work was originally published in Swedish in 1920–24. We are grateful that it has now been translated; it is the only available book of its kind, reaches a very high standard, and makes thoroughly interesting reading. Classical antiquity, the Middle Ages, and the Renaissance occupy the first 120 pages, the seventeenth and eighteenth centuries the next 180, the nineteenth century and later the rest of the book—well-chosen proportions. The print is small and close, so that the mass of scholarly information which the author presents is very large. Botany seems to be relatively neglected; pathology and bacteriology have about the space which their present importance in general biology deserves. The translation would have been improved by more thorough technical revision; *Drosophila* is not a parasite, "analine associations" is curious English for aniline dyes, "ink-fish" is an unfamiliar name for cuttle-fish, "mechanistic" and "mechanical" seem to be confused, some sentences are hardly intelligible. The index, too, needs considerable expansion. These are, however, small defects in a very notable pioneer attempt.

THE LANCET.

LONDON: SATURDAY, JUNE 1, 1929.

TRAINING FOR THE PUBLIC HEALTH SERVICE.

THE London School of Hygiene and Tropical Medicine has issued a pamphlet outlining the course of study to be entered upon in October of this year for the diploma in public health. The appearance of this pamphlet serves as a reminder that this great school of preventive effort, conceived on the lines of the report of the Athlone Committee in 1921, and made possible by the large benefaction of the Trustees of the Rockefeller Foundation, is about to enter upon its full programme of work. We learn, in fact, that the new home of the School in Bloomsbury immediately adjacent to the University site will be opened by the PRINCE OF WALES in July. The incorporation in the new School of the old School of Tropical Medicine in 1924, and the fact that tropical hygiene and research have an arresting and picturesque character, have to some extent obscured the fact that the London School of Hygiene and Tropical Medicine have been slowly building up, concurrently with the growth of the fine structure in Portland stone which is to be their future home, the organisation which is to carry out the first conception of the School as a centre of public health training.

On the laboratory side, the subjects of bacteriology, of chemistry as applied to hygiene, and of parasitology as applied to public health, all contribute to the wholly admirable course of study for the diploma which is set out in the new syllabus, in addition to providing for advanced courses of study and research in the various subjects; this is true also of the subjects of epidemiology and vital statistics. The laboratory work is clearly designed to take its place as an aid to the solution of the general problems of public health which will confront the prospective medical officers of health, rather than as an end in itself. The course of study as a whole, with the regulations of the General Medical Council in view, extends over a period of 12 calendar months divided into three terms of 12 weeks each, and can be fully covered by students prepared to give five afternoons weekly from 2 till 6. This arrangement will be of particular advantage to practitioners who during this period of qualification for the diploma have other calls on their time during the mornings. The whole of the lectures and demonstrations on the theory and practice of public health administration and the principles of sanitary law find their place in that part of the course of study for which the professor of public health is responsible, and the course embraces some 40 visits to places of public health interest. It is an interesting new departure in this scheme of study, and typical of the whole underlying intention to secure the very best results, that the practical work under a medical officer of health, which is an essential part of the period of training, has been arranged in two selected areas as part of the School's organisation; the necessary instruction in infectious diseases and hospital management is also provided for, as well as lectures and demonstrations in applied physiology and lectures and practical classes in sanitation and sanitary engineering.

The course of study is so designed that those wishing to do so may proceed to the new academic diploma in public health instituted by the University, and it is at the same time clear that those responsible for the course have in mind the importance of turning out men for the public health service thoroughly well equipped for the career which is in front of them. This British school stands at the door of opportunity of building up a great international reputation. The excellent work that the University and the Board of Management have done in the appointment of the team of professors and other scientific and administrative staff promises well for the establishment of this reputation. In the field of public health, particularly, new ground is broken, and a great advance made on anything previously attempted, and there is a real promise that men bearing the hall-mark of a University diploma and equipped with a first-rate practical training will carry the good report of the new School to the far corners of the earth.

THE SURGERY OF LOW BACK PAIN.

THE causation and treatment of what is known as low back pain has of recent years been much debated, especially among surgeons in America. In this country it has been thought till lately that pain in the back and hips is seldom due to any anatomical abnormality. Improved means and methods of radiography, however, as well as evidence coming from the United States, have somewhat modified this opinion. The interest taken in the subject justified the British Orthopædic Society in selecting Deformities of the Lumbo-sacral Region of the Spine as the subject for the Robert Jones Gold Medal and Prize in 1927. The essay which gained the prize, written by Dr. JAMES F. BRAILSFORD, of Birmingham, was published in the April number of the *British Journal of Surgery*. His research has been a thorough one, based on a study of over three thousand radiograms and has included clinical examination of those patients whose radiograms showed abnormality. Moreover, Dr. BRAILSFORD has investigated, by dissection and X rays, the lumbo-sacral region of 40 post-mortem subjects, and has, further, examined and photographed specimens in the museums of the Royal College of Surgeons and of the University of Birmingham. His conclusions are thus founded on anatomical data and will carry weight with surgeons and pathologists.

In seeking the cause of low back pain with a view to relieving it by operation or otherwise, it must be remembered, as Dr. BRAILSFORD says, that developmental irregularities may be present and demonstrable, without giving rise to symptoms, and also that even when irregularities and symptoms are present together they are not always in the relation of cause and effect. The deformity most frequently associated with a developmental defect in these three thousand cases was scoliosis due to asymmetrical sacralisation of the fifth lumbar transverse process. But apart from such curvature this developmental anomaly may lead to narrowing of an intervertebral foramen and acute neuralgia in the distribution of the nerve in question. The deformities due to developmental irregularities which alter the alignment of the vertebræ tend to become more pronounced with age. He concludes further, that symptoms and deformity following injury to the lumbo-sacral region in which osteo-arthritic changes have occurred may be more pronounced than would be expected from the degree of trauma; also that carcinoma and Paget's disease of the lumbo-sacral spine produce definite changes in the bone which can be recognised in a radiogram before any clinical deformity is apparent, and that the pain associated with these conditions may be referred by the patient to a recent injury. As to spondylolisthesis, about the cause and frequency of which displacement of the body of the fifth lumbar vertebra there have been and still are such great differences of opinion, Dr. BRAILSFORD's experience leads him to the conclusion that it is a relatively rare deformity. The convincing description which he gives of the characteristic appearance of antero-posterior and lateral radiograms leaves no room for the suggestion that the condition has been overlooked in any of his cases, or that ante- or post-mortem section would have shown a greater frequency of the condition.

From the other side of the Atlantic comes the report of an inquiry on somewhat similar lines, directed from the point of view of operative surgery, and based chiefly on findings at the time of operation and on post-operative clinical experience in cases of developmental abnormalities at the lumbo-sacral juncture, causing pain and disability.[1] Dr. HIBBS and Dr. SWIFT have supplied an account of all the patients without exception who have been subjected to a certain operation for one definite class of symptoms; since these records cover a sufficient interval of time after operation they are of solid value in enabling us to estimate the true scope of a comparatively new operative treatment. The 147 operations in question were performed from two to thirteen years ago, between October, 1914, and January, 1927. The technique used was that of lumbo-sacral fusion by Hibbs's method of joining the laminæ of the vertebræ immediately above and below the lesion. It was performed for the relief of low back pain and disability which was thought to be due to some purely mechanical defect at the lumbo-sacral juncture, the result of an anatomical variation and not of injury. The sexes were almost equally represented in the series. Seventy-three per cent. were entirely relieved, 14 per cent. were relieved, and only 19 were unimproved. This in such a troublesome class of affections is a gratifying result. Low back pain has been very often attributed in the United States to sacro-iliac subluxation, often, as it has seemed to us, on slight grounds. It is significant that Dr. HIBBS and Dr. SWIFT state "that in all these patients no evidence of sacro-iliac pathology was recognised."

These two publications are useful as throwing light upon a subject which up to the present has been somewhat obscure, owing to the difficulties only recently surmounted of obtaining adequate X ray pictures, and also to the relative infrequency of opportunities of directly examining the parts affected, either during life or after death. Improved apparatus and the skill of radiologists and the ingenuity and enterprise of surgeons have to a great extent now triumphed over those difficulties. The researches of Dr. BRAILSFORD and those of the American surgeons have points of contact, especially on the subject of the pathology of spondylolisthesis. There were 23 cases of this deformity in the series showing it to be a relatively common one. Moreover, the authors state that "There was found uniformly to be a separation of the laminæ of the fifth lumbar from its pedicles," whereas Dr. BRAILSFORD finds such a solution of continuity of the neural arch to be rare. More extended operative experience and further radiographic investigation will doubtless settle this and other doubtful points.

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THE INSTITUTES OF MEDICINE.

THE curriculum grows longer and longer, and yet there seems to be no more time than there used to be for all that is judged to be necessary for the student's salvation, and no time at all for the leisure he needs to "walk with God" (as a Spaniard would say) and educate himself. Discussions on how to use the years to the best advantage go on without end, all sorts of plans are proposed, there seem to be as many perfect routes to qualification as there are cures for rheumatism. But in these discussions there is one obvious trend. We hear little of too much time being spent on surgery or gynæcology or oto-laryngology; it is nearly always the laboratory sciences which are suspect, whose methods are criticised, whose value is doubted. The physiologists in particular are accused of forgetting that their students are destined to be medical men, and of setting out to train them to be investigators of abstract science rather than practitioners. There is, in short, a current of opinion about that it might be well to return to some extent to the old plan whereby boys were taught to treat sick people on Mr. Squeers's plan of cleaning windows—by doing it. It is difficult to judge exactly how seriously these proposals are made; we believe that all experience shows them to be ill-judged. The laboratory sciences have rightly been called the institutes of medicine for two distinct reasons: one concerns the body, the other concerns the spirit. In the first place, a certain amount of knowledge of chemistry, physics, biology, anatomy, and physiology is a technical necessity to any but a quack practitioner. To define the minimum which is "necessary," is as impossible as it is to draw a sharp line between quackery and respectability, but in general the more a man knows of such things the better doctor he will be. The proportion of the curriculum devoted to them is a matter of common-sense compromise and reasonableness. The second consideration concerns the quality rather than the quantity of laboratory work. If chemistry and physiology are to be taught from an exclusively medical point of view, the student will lose some of his best experience—the atmosphere of disinterested idealism and his contact with the great men that move in that atmosphere. Not all laboratories have the atmosphere, and many of them unfortunately lack the great men, but talking to middle-aged and elderly medical men of their student life one cannot but be impressed by the frequency with which they mention a professor of botany or anatomy or physiology as the personality which opened up a fresh world to them which they have always treasured and been grateful for; it is from science teachers as often as from clinical teachers that the student has learned that it is worth while to know about things.

Dr. L. B. WILSON, the director of the Mayo Foundation, has lately been examining this point by questionaire and statistical analysis[1] and his results in America fully confirm the clear impression of casual conversations in this country. To substitute "surgical anatomy" and "medical physiology" for what we have now, would be frankly to degrade them and to deprive the student of what contributes substantially to make the good doctor—the wise humane man who knows that the complement of being able to tell the number of the stars and call them all by their names is to comfort those who are broken in heart and give them medicine to heal their sickness.

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[1] Developmental Abnormalities at the Lumbo-sacral Juncture causing Pain and Disability. A Report of 147 patients treated by the spine fusion operation. By Russell A. Hibbs, M.D., F.A.C.S., and Walker E. Swift, M.D., Surgery, Gynecology, and Obstetrics, May, 1929, p. 604.

[1] Jour. Assoc. American Medical Colleges, April, 1929, p. 146.

Annotations.

"Ne quid nimis."

THE HOME AMBULANCE SERVICE.

THE work of the Home Ambulance Service carried out under the guidance of a special committee of the Joint Council of the Order of St. John and the British Red Cross Society is well known to our readers. The importance of the service rendered and its increasing scope are discussed in the ninth annual report of the Joint Council. Actually the Home Service Ambulance Committee is ten years old, for it existed for a year before it came under the control of the Joint Council in 1920. These ten years have seen many changes in the public need for conveyance during ill-health. The number of patients attending hospitals, more especially for radiographic examination and various forms of treatment in the electrotherapeutic departments, has greatly increased. Without an efficient ambulance service a large proportion of these patients would have been unable to take advantage of the latest forms of treatment. The other change which has come over the country is the alarming incidence in road accidents; but this report pleads that if the developments of transport are responsible for an increasing number of accidents to life and limb, to transport must also be credited a considerable share in the restoration of health to the sick. It was the custom in the early days of the Home Ambulance Service for ambulances to be lent for use in the larger towns, but a large number of the municipal authorities have now established their own ambulance stations, thus permitting a wider extension of the service in rural districts. It is not always realised by those who benefit from an organisation which enables them promptly to obtain an ambulance almost anywhere in England and Wales by the use of a telephone that all this transport work is quite unpaid. Those who have volunteered for the work must submit to disturbance of their hours of business and to interruption of sleep. In fair or foul weather the ambulance call must be answered without delay. Those who give first-aid service on the roads surrender their holidays and week-ends to the task of helping the injured or to the even more tedious one of waiting prepared for accidents. The report points out that too often these highly skilled, yet unpaid, services are accepted as a matter of course and receive but scant reward in the way of praise and thanks. A recent development of the activities of the Home Service Ambulance Committee is the mobile X ray service which, though primarily designed for use in and around London, has occasionally been called upon to go as far north as Cumberland. It is admitted that a poor or indifferent X ray photograph is almost worse than none at all, and it has been the object of this X ray service to achieve and maintain a very high standard of results. Many small hospitals, whose finances do not permit of the installation of satisfactory plant, take advantage of this service. Arrangements have been made with the British Institute of Radiology whereby the films produced by the mobile X ray plant together with the history of the case are submitted to a consulting medical member of the Institute whose considered opinion is forwarded with the radiograms to the doctor in charge of the case. The mobile apparatus can be converted from a diagnostic into a treatment unit in a few seconds, and in the event of any breakdown a second car fully equipped can be put on the road without delay. The Home Service Ambulance Committee and the helpers inspired by the central organisation deserve the utmost credit for the inauguration and development of a service of national importance.

SOME MALARIA INVESTIGATIONS IN AFRICA.

AN antimalarial Commission was founded in Egypt in 1916 to ensure such coördination between various Government Departments as would make for progress in a campaign against malaria. Following a preliminary report issued in December, 1918, its first report,[1] dated 1928, deals with the period 1919 to March, 1925. It is a truism that no pipe distribution of water to a town within the area of malarial endemicity should be undertaken until a complete system of drainage to carry off all surplus water has been established, otherwise it will multiply anopheline breeding places and malaria will increase. On an immense scale this is just what is tending to happen in Egypt. The great extension of agricultural irrigation during the last two decades, with which agricultural drainage has not kept pace, has resulted in raising the water table and producing many outcrops of infiltration water. It is control of this infiltration water which constitutes the most difficult antimalarial problem in Egypt. Although by law rice culture, which implies irrigation, may now be interdicted within two kilometres of any town or village, it has been found more satisfactory merely to control it. The incidence of malaria has been ascertained by a wide spleen survey. The spleen index is generally low, infrequently over 5, but varying between 0 and 32, and often shows striking local differences; endemicity is greatest in the Suez Canal zone and in the oases. In the former, drainage and filling have been carried through with the cordial coöperation of the Suez Canal Company. The oases present a special problem. They are depressions in the Lybian desert, Siwa being indeed 55 feet below sea level with spleen-rates between 23 and 61, and watered by springs, either natural or flowing through deep artesian wells, with wooden shafts often reaching a depth of 450 feet. These springs, too, supply irrigation channels, the water finally reaching the nearest hollows and there breeding anopheles freely. When the antimalaria work began in 1916 the oases had just been recaptured from the Senussi. Soon they were brought within 12 hours by car of civilisation, so that the risk of diffusion of malaria into Egypt became considerable. In the two largest of them, with their population of 26,000 in scattered villages and with their peculiar levels, complete control of mosquito breeding proved impossible with reasonable expenditure; use has been made of the palliative filling of hollows, of quinine, and of the distribution of the fish *Cypronodon dispar*, a voracious feeder on mosquito larvæ, which was left behind when the sea receded in past ages. In Siwa, however, complete control has been possible, with a consequent fall in the spleen-rate from 23 to about a tenth of that figure; the birth-rate exceeds the death-rate, a condition new in the history of the place; and the trading Bedouin Arabs, who used to shun Siwa at night, now sleep in the village square. Another valuable publication by the Commission is T. W. Kirkpatrick's "Mosquitoes of Egypt," a monumental work which deals with the classification of over 30,000 specimens collected throughout Egypt and which will form a fund of information from which all who follow him will freely draw, when malaria control by "species sanitation" is more widely attempted in Egypt. In the Second Report,[2] the reconstituted Commission describe the continuation of their predecessor's work whose results in Egypt proper, for instance at Kom Omro, on the east bank of the Nile north of Aswân, have been of such striking value to a country in which most of them no longer work.

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[1] Egyptian Government Anti-Malaria Commission. Report No. 1 (1919–25). Government Publication Office. Ministry of Finance, Dawawin P.O., Cairo, 1928. Pp. 60.

[2] Report No. 2. (1925–26). Pp. 20. Price P.T. 10.

At the other end of the continent, the South African Union's Institute for Medical Research has played its part in the Union's malaria problems by a mosquito survey in eastern and northern Transvaal, carried through by A. Ingram and B. de Meillon.[3] It is believed that the two main local carriers of malaria are *Anopheles gambiæ* (*A. costalis*) and *A. funestus*, particularly the former, since during an epidemic at Rustenburg, it was captured in houses, gorged with blood, and is much the more numerous of the two during the malaria season. Two observations, published since this report was made, suggest hesitation in accepting these conclusions. J. Schwetz[4] has shown in the Belgian Congo that the percentage of infected mosquitoes in his particular catches were, for *A. gambiæ* 18, *A. funestus* 4, *A. nili* 13, and *A. marshalli* 8. The two last are among the 14 anopheline species reported from the Transvaal, and have now to be added to the list of malaria carriers; so that when species sanitation is investigated in South Africa these two mosquitoes also will have to be considered. The second significant observation, by L. W. Hackett,[5] relates to malaria in Sardinia, where anopheline density during the malaria season was negligible, although two months earlier it had been heavy. When, then, it is noted of Brits, in the Transvaal, that during the malaria season of 1926 *A. gambiæ* and *A. funestus* were absent, it need not signify that they are not important local carriers, but it does show the vital importance of carrying a local survey over a whole year.

BIOPHYSICAL ASSISTANTS.

WE are glad to see that the Society of Apothecaries of London, at the instigation of the British Medical Association, is taking steps to establish a roll of persons of guaranteed training and competency to whom medical men can confidently issue prescriptions for treatment by electricity or irradiation. An approved course of training will be required of all technicians who desire to be placed on the register, and all applicants after May 31st, 1930, will be required to pass an examination; the details of the requirements in these respects have not yet been issued. Meanwhile, following the tradition of similar schemes of qualification, technical assistants of approved standing and experience may be admitted to the roll, the main requirement being two or three years' practice in an approved institution. This is by no means an extravagant demand and it may possibly prove to be too lenient. Registered members on the roll will on their side undertake to conform to various professional obligations, the most important being that they will not undertake the treatment of any patient except under the direction and control of a registered medical practitioner.

The mechanical and technical apparatus of medicine has become so complicated that there is bound to be a progressive movement in the direction of this scheme for technicians of biophysics—a queer name, though it is hard to think of a better one. Pharmacy has long since shown the way and has realised a high and rising ideal. The clinical laboratory is catered for by the Pathological and Bacteriological Laboratory Assistants Association which, in collaboration with the Pathological Society, issues certificates of proficiency to technical assistants who can satisfy stringent requirements of training and knowledge, tested by examination. This association is of particular interest because it was founded by the assistants themselves without any very clear demand from outside, and it has progressed to its present position of authority and usefulness along the lines of an old-fashioned trade-union. In some ways this seems to us a rather better plan than that undertaken by the Society of Apothecaries. Once the right standard is set, the members of a technical association may be trusted to guard their qualifications as jealously as any outside body, and we hope that in the end the biophysical technicians may have a large share in the conservation of their own roll. In any case we wish the movement success, and look forward with interest to the publication of the conditions of training and examination which will come into force next year.

THE SALFORD V.D. SCHEME.

IMPORTANT changes in the scheme whereby the city of Salford attempts to cope with the venereal disease problem were made on April 1st, 1928, and the report of the first nine months of work has now been issued by the medical officer then appointed. From 1917 till April, 1928, a treatment centre was housed in the out-patient department of Salford Royal Hospital. It was open only on four days a week for a limited time, though intermediate treatment could be obtained daily during one hour by women and during two hours on three days in the week by men. The medical officers, four in number, attended during 12 hours each week on a part-time basis, and there was no official director. The municipal clinic established last year to replace this centre was placed under the supervision of Dr. E. T. Burke, who is responsible to the medical officer of health. Dr. Burke works on a whole-time basis, as does also the assistant V.D. medical officer, Dr. F. W. F. Purcell; they attend the clinic for at least 60 hours per week. It is open for five days from 8.30 A.M. till 8.30 P.M. each day, on Saturdays for 5½ hours in two separate periods, and on Sundays for 6 hours in two separate periods. The clinic is housed in premises specially arranged and equipped for venereal disease work alone. Six beds are already available for in-patient treatment, but more beds are said to be required. The main principle of the clinic as now organised is that the unit to be treated is not the individual but the family. Thus, if a child is suffering from venereal disease, every effort is made to get the parents and other members of the family to attend for examination and, if necessary, for treatment. Statistics are given to show that the number of cases dealt with in the nine months (1220 new cases, 35,503 total attendances, and 26,155 intermediate attendances out of a population of 247,600) compares favourably with that of other treatment centres concerned with a similar size of population. Dr. Burke attributed the immediate success of the clinic to the fact that the treatment is given in an institution specially organised for the purpose by a staff of workers whose whole time is devoted to their duties. In his view such a clinic is more able to render efficient service than one attached to a general hospital, and the patient is quick to realise the fact. When there is a medical school in a town it is essential that the clinic should be within the teaching hospital, but he holds that it should be a distinct department and not a mere annexe to the general out-patient department. It should be linked up with the other teaching activities of the school, and the medical officer in charge should have the full status of honorary member of the staff. The question of defaulters is discussed in the report. During the nine months under review 433 letters were sent to patients who had ceased their attendance at the clinic prematurely—that is, when their superficial and obvious symptoms had disappeared, but before they were officially discharged. These letters brought just under a third of the defaulters back to the clinic, and of these, 116 are still attending. Twenty-eight of those returning have since been discharged, 6 were transferred, and 10 returned for a period only. Six reported that they were under their own doctor, and 13 gave other causes for their absence. Of the rest, 118 had given wrong addresses, and from 137 no reply could be obtained. Examination of the case cards of all the defaulters showed that 71 individuals ceased attendance while still in a highly infectious state. In Dr. Burke's view the demand for some powers of compulsion to ensure that all persons suffering from venereal disease shall submit to treatment and shall continue with it until they are not infectious is increasing, and he holds that the question of compulsory treatment, not compulsory notification, is one which must soon claim serious attention by local authorities, for at present a great deal of the money spent is being wasted by the defaulter. The objections to the institution of compulsory treatment for one set of diseases alone, and the difficulty of deciding on a standard of cure for syphilis or for gonorrhœa acceptable to the profession as a whole are not discussed by Dr. Burke, whose enthusiasm for the unfettered development of the campaign against venereal disease may blind him to the wider issues involved. It is satisfactory to note that the laboratory reports performed by Dr. G. J. Crawford, the city bacteriologist, have always run parallel with the clinical findings, and expectations have been of inestimable value in the diagnosis and in the control of treatment. When the clinic was opened, an invitation was sent to every practitioner in the city to inspect the premises, and it was also pointed out that by attending at the clinic for tutorial purposes a practitioner could qualify for the free issue of arsenobenzol compounds with which to treat cases of syphilis. So far only one practitioner has availed himself of this privilege. Certain practitioners, however, make full use of the facilities provided for diagnosis and treatment. Routine courses of treatment for the various stages of syphilis and gonorrhœa are set out in the report, though it is noted that the routine for gonorrhœa is at present undergoing revision. The criteria of cure adopted at the clinic for syphilis, except neurosyphilis, are as follows: (1) Iodides are given for two weeks preceding each Wassermann test. (2) A negative blood Wassermann should be obtained every three months for one year after the cessation of treatment. Two years after the cessation of treatment the blood and cerebro-spinal fluid must be negative after provocation.

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[3] Publications of South African Institute for Med. Research, 1929, iv., 83.

[4] Trans. Roy. Soc. Trop. Med. and Hyg., 1929, xxii., 457.

[5] Ibid., p. 477.

THE ANTIVIRUS OF BESREDKA.

THE communication, reported in THE LANCET of last week, which Prof. Besredka had made in absentia to a section of the Royal Society of Medicine was somewhat sharply discussed by many of those present. It was unfortunate that Prof. Besredka was unable to reply to his critics in person. Besredka's recent work has been concerned with two distinct issues which unfortunately have become rather confused: (1) the value and use of local inoculation and the extent of local immunity; and (2) the possible prophylactic and therapeutic value of the substance he calls antivirus, which is, in effect, a filtrate of broth in which organisms have grown until for some reason or other their existence has terminated and they have begun to die out. This decline is an invariable phenomenon in bacterial growth and has not unnaturally been attributed to the exhaustion of food substances which, of course, must be a contributory factor. It is more than possible, however, that this is not the whole story, since such exhausted media will often readily support organisms of another species and sometimes those very closely though not specifically related to the first organism. Besredka assumes the production of a specific substance in the course of bacterial growth which acts inimically upon the organism and finally inhibits it. This is his "antivirus," and to it he attributes a very definite therapeutic value. The other matter, which occupied Besredka's attention at an earlier date, is the important question of local immunity and the possibility of local inoculation—whether, for example, immunity to anthrax is a special function of the covering layer of the body, or a general function through all its tissues and, similarly, whether immunity to local intestinal disorders, such as dysentery, can be obtained by local application to these same tissues as effectively or more effectively than by the better known process of subcutaneous inoculation. This is a very wide and important problem of which the bearings are not yet by any means worked out. Certain experimental work, especially that upon the virus diseases, strongly suggests that tissue affinities are important functions in determining infections and that their relation to immunity is therefore of great importance. Unfortunately, in Besredka's more recent writings and in the minds of many of his readers, these two distinct and separate issues have become blended and confused. The question of local immunity, which is essentially one capable of experimental investigation, has become shrouded with the obscurity attendant upon the evaluation of clinical results obtained by the use of antivirus in treatment. This last, as Besredka's critics have rightly pointed out, is a matter for clinical judgment and opinion, and therefore from the scientific point of view is much more difficult to handle than the clearer problem of local resistance and immunity. The confusion of these issues, which to our mind should at this stage be considered separately, has arisen from Besredka's belief that the direct application of his antivirus to the tissues will promote a local immunity such as in his earlier work he claimed to result from the application of living organisms. Prof. Besredka has not produced sufficient evidence to convince us that his antivirus has the power he believes it to possess, but obviously the only satisfactory method of determining its activity is that of actual and extensive clinical trial. Nor should the wider problem of estimation of the influence of site and tissue constitution upon susceptibility to infection, which his work so largely involves, become obscured in any controversy on therapeutic results, since its development is of fundamental importance to the whole of medicine.

TRAINING OF GENERAL PRACTITIONERS IN TUBERCULOSIS.

IN most countries the experts in tuberculosis complain that the general body of medical practitioners do not get properly trained in the diagnosis and treatment of tuberculosis in its various forms; and these complaints are not without justification. Dr. S. Vere Pearson at the Zürich meeting (which we report elsewhere) set out the chief reasons for this neglect of what is still a common disease in spite of the decline in its incidence. These are two-fold: (1) the lack of clinical material in most of the teaching hospitals; and (2) the absence of teachers interested in and expert at the diagnosis and treatment of this malady. In England and in many other countries tuberculous patients are excluded from the wards of the teaching hospitals, even more than they used to be twenty years ago, owing to the fact that the diagnosis and treatment of tuberculosis in its various forms has come into the hands of those medical officers who are managing the State medical services specially devised to deal with this disease. Occasional exceptions are to be found, the most brilliant being in Scotland, where the influence of Sir Robert Philip has brought about a better state of affairs. In the University medical schools of Edinburgh and Glasgow practically all the students go through the tuberculosis department and receive instruction in this specialty. Another exception is afforded by the few teaching hospitals which have a tuberculosis department (it may be a dispensary under the public health tuberculosis schemes also) attached to them, as at St. Thomas's and Guy's Hospitals in London. Again, at Manchester there are two University teachers who are expert in tuberculosis, one of whom is also an officer under the public health authority. Dr. Pearson admitted the overloading of the medical curriculum with subjects, the teachers of which are clamouring for recognition, but he contended that no disease is better suited than tuberculosis for teaching those principles of hygiene and medical practice which should form the foundation of a medical education. Nevertheless in England and in most other countries where there are special post-graduate courses in tuberculosis, these courses are not, as a rule, attended by general practitioners, but by those who are already in this specialty or about to take it up. Grants of money are made out of the funds of the local authority, supplemented to the extent of 50 per cent. by central funds towards the expenses of such courses for medical officers attached to the public health service. But so far as Dr. Pearson has been able to ascertain, no country save Norway (the province of Bergen) has allotted money from public funds to subsidise general practitioners to gain a knowledge of sanatorium treatment. The result is unfortunate in producing a feeling of grievance among general practitioners that the treatment of tuberculosis has been taken out of their hands.

THE EVOLUTION OF PÆDIATRICS.

Of the many factors which have modified the scope and the activities of the general physician in the present century, one of the most potent has been the evolution of pædiatrics as a specialty. Those who were privileged to hear Dr. F. J. Poynton's presidential address on May 24th to the Section of Disease in Children at the Royal Society of Medicine were given an interesting survey of this process in the past, together with some shrewd deductions about its effect upon the future. Taking as his subject Some Phases in English Pædiatrics as Viewed by a General Physician, Dr. Poynton did not approach it in the spirit of a mere laudator temporis acti, but extended to those who follow him an appreciation no less generous than his tributes to the teachers from whom he acquired his art. He depicted the contrast between the work of the physician at the close of the last century and at the present day, both in respect of the material at his disposal and the problems which it presented to him. In former times opportunities for clinical observation were exceptionally great; a vast amount of material was available; epidemic diseases were the cause of an enormous mortality, and the nature of many common children's diseases was as yet unrevealed. The physician of this time could thus acquire a broad outlook on disease, and get an idea of the value of detailed observation. His knowledge and methods were individual; hence it is not surprising that some of the greatest teachers of clinical medicine belonged to this period. Their discoveries were the result of wide experience, combined with that power of careful observation and criticism which belongs to the highest order of intelligence. Cheadle's recognition, in 1878, of the identity of infantile scurvy with the adult form, which he had observed during protracted journeys in Canada, was an instance both of the opportunities and the achievements of his time. Nowadays, a large amount of clinical material has been removed as a result of advances in treatment and prophylaxis, while the process of specialisation has made it impossible for the physician to carry out more than a portion of the necessary investigations. The sciences of bacteriology and biochemistry, having new ground to break, have made comparatively greater advances, and a tendency has arisen to regard "research" as belonging more properly to the laboratory than to the bedside. The physician has to some extent been driven to shift his ground, and become a collector of uncommon cases rather than an investigator of those which are of greater importance to the community.

While he recognises that specialisation is bound to increase, and that methods of investigation and research must reach a complexity which will place them still further beyond the attainments of any individual, Dr. Poynton maintains his faith in the continued utility and fruitfulness of clinical observation, and supports its claim for recognition as an important element of research. The interaction of the organs of the body will always make it imperative that the body should be studied as a whole; if the greater number of physicians become increasingly absorbed in pursuing special lines, it may come to pass that the real "specialist" of the future will be the physician who has knowledge of general disease.

In considering the changing position of the pædiatrist who is a member of an honorary hospital staff, Dr. Poynton discussed with great acumen the problems which arise from his relation with the public services, such as the municipal clinics and the Ministry of Health. Children, more than any other section of the community, are a concern of the public services, and already there are signs of some difficulty in apportioning the exact functions of the clinics under the direction of the local authorities and of the childrens' hospitals. Theoretically, the one may be intended for the supervision of normal children, and the other for the treatment of sick ones, but in practice the distinction is not easily drawn. From the point of view of the public, there is much to be gained from the development of these services, and the pressure of public opinion will compel the Ministry of Health to extend its activities. In combating chronic diseases such as rheumatism, in which the child must be under observation and periodic treatment for a number of years, Dr. Poynton thinks that collaboration between the hospitals and the public authorities should be particularly fruitful; yet there is always danger of diminished efficiency resulting from lack of continuity in the methods of treatment adopted. The medical advisers of the public services will provide a highly organised machine for prevention and treatment of disease, but medical teaching, he said, is not a natural product of organisation, and must be provided by a body such as the children's hospital, maintaining its independence but ready to collaborate and advise. An important part in the maintenance of unity and coöperation between these two groups of pædiatrists might be played by the Section to whom this address was delivered, which includes representatives of public services and of hospital staffs, but is independent of both.

OHARA'S DISEASE.

Dr. Hachiro Ohara has recently reported two cases of tularæmia in a father and son who infected themselves by skinning and dressing a rabbit. The special feature of these cases was that in both the primary site of infection was in the nostril, with local swelling and inflammation and enlargement of lymphatic glands. Ohara recalls that he independently described cases of tularæmia and experimentally transmitted the disease to human beings in 1925. Francis and Moore suspected that these first cases described by Ohara were of the same nature as tularæmia which had been very thoroughly investigated in man by McCoy and Chapin in 1910, by Wherry and Lamb in 1914, and by Francis in 1919 and in a number of subsequent studies in the United States. Francis and Moore proved the identity of the disease in Japan and America by obtaining agglutination of *Bacterium tularense* with serum from Ohara's cases which he had sent at their request. The clinical form taken by cases of tularæmia is very varied on account of the different means by which infection is acquired and the different sites of inoculation. "Deer-fly fever," in which the primary lesion was on the neck or other exposed part, was known and believed to be due to the bite of *Chrysops discalis* before Pearse described cases in 1910. In the United States 407 cases had been described by 1927 and four types of the disease had been noted. In three of these types there was obvious glandular enlargement which was associated with a papule or ulcer on the skin in 272 cases, with a primary lesion on the conjunctiva in 25, and with no recognised primary lesion in 16; the fourth type was described as typhoidal in nature without glandular enlargement and was observed in 24 cases. The disease in man is most commonly due to handling and skinning infected rabbits and hares. It is said to occur over a considerable area in Japan and is very widely distributed in America but so far is unknown in Europe. *B. tularense* was discovered by McCoy and Chapin in ground squirrels in 1912. Francis has summarised the history of the disease in the De Lamar lectures for 1926-27. He points out among the special features of the disease that it is extremely infectious, especially for laboratory workers, that the serum of patients agglutinates *Bacillus abortus* and *B. melitensis* as well as *Bacterium tularense*, that the bacterium can penetrate the uninjured human skin and that the number of species of naturally susceptible animals and of insects which can act as vectors is very large.

ESSENTIAL THROMBOPENIA TREATED BY LIGATURE OF THE SPLENIC ARTERY.

It is agreed that certain conditions characterised by a tendency to hæmorrhage can be either completely cured or greatly improved by removing the spleen. The rationale of this treatment was set out by Dr. W. Cramer in our issue of May 18th (p. 1048), and it is sufficient for our present purpose to recall that a clinical entity is now recognised in which the purpuric hæmorrhages are associated with and presumably due to a primary thrombopenia caused by an excessive destruction of the blood-platelets by the spleen. Owing to the condition of the patients in this disease there is a considerable operative risk involved in treatment by splenectomy—a fact to which we drew attention in a leading article in the same issue. It has, therefore, been suggested that a less severe operation should be substituted for it—namely, ligature of the splenic artery—and in a recent paper F. van Goidsenhoven[1] reports the results in two acute and ten chronic cases of the disease. The clinical histories, which are given in detail, seem to justify the author's conclusion that the therapeutic effects of the two methods of treatment are essentially the same. The minor operation is, therefore, clearly indicated when the condition of the patient is so bad that the major operation would involve serious risk. Van Goidsenhoven doubts whether removal of the spleen has *any* therapeutic advantages over ligature of the splenic artery and pleads for a more extensive trial of ligature to decide this point.

CHORIONEPITHELIOMA IN A MALE.

The puzzling manifestation of malignancy described as chorionepithelioma in a male is so rare that every case is worthy of record. Dr. J. Tansey and Dr. L. Utz, of Sydney, describe[2] such a case which occurred in a young man aged 25. The primary site of this type of tumour is usually the testis, but in the present case the testes were normal, though small, and the site of the primary tumour was in the left lung with numerous metastatic nodules in the right lung. The tumour nodules were hæmorrhagic and microscopically presented the appearance of a chorionepithelioma, both syncytial cells and Langhans cells being observed. These features are illustrated by microphotographs. It is interesting to note that there was enlargement of both breasts, and it is stated that sections of the breast showed "well-marked acini, dilated ducts, and some evidence of chronic mastitis." The disease developed very rapidly with pain in the chest, general weakness, and loss of weight. A fortnight after the first onset of pain there was a brisk hæmoptysis and in a little over two months the patient died. There are obvious difficulties in accounting for the origin of this tumour, especially as there was no evidence of teratomatous elements elsewhere. The explanation given by the authors is based on the well-known observation of Schmorl that chorionic cells may frequently be found in the pulmonary capillaries of women who have passed through a normal pregnancy. The authors ask: "Is it too much to expect that these same cells could occasionally enter the fœtal circulation and lodge in the pulmonary circulation of the fœtus?" They do not, however, stay for an answer, and at once proceed to assume that these cells remain there as "chorionic rests," which later undergo a malignant transformation. It seems simpler to make the admission that no adequate explanation of such a condition can at present be given if it is certain that the malignant tissue is derived from chorionic cells.

HOSPITALS AND THE KING'S RECOVERY.

Hospital Sunday falls this year on June 2nd, and the Lord Mayor of London, as president of the Metropolitan Hospital Sunday Fund, has sent a letter to clergy and ministers of all denominations suggesting that collections taken in the churches on that day should form part of the national thank-offering for the King's recovery. The whole of the amount paid into the Hospital Sunday Fund collection will be distributed to the hospitals and charities of London in the usual way, but on this occasion the part played by medicine and surgery in His Majesty's restoration to health will be in everyone's mind, and it is hoped that the general gratitude will find expression in an especially generous response to the annual appeal. A further opportunity for supporting the voluntary hospitals will, of course, be given to the public on Sunday, June 16th, the day appointed for national thanksgiving in the churches. It is proposed that the proceeds of offertories on that day, too, should go to the hospitals, and in order that all the people, whether churchgoers or not, should be invited to contribute, the British Hospitals Association has asked Lord Mayors and mayors throughout the country to appeal in the press for the benefit of their local institutions, making it clear that those who respond are taking part in the national thanksgiving. The lists in the provincial press are to be closed on Saturday, June 15th, so that the total amount collected by this means and through the churches may be announced early in the subsequent week. Donations intended for London hospitals may, if desired, be sent directly to King Edward's Fund for London, Worcester House, Walbrook, E.C.4, whilst those destined for hospitals elsewhere may, if desired, be sent to the President of the British Hospitals Association, at 19, Berkeley-street, W.1.

THE SUPPLY OF DENTAL PRACTITIONERS.

At the final session of the Second Dental Board its Chairman, Sir Francis Dyke Acland, spoke feelingly of the supply of dental practitioners. Ever since the Board completed its arrangements for the Dentists Register and was free to settle down to its proper work, it has devoted itself as a primary object to giving facilities for a larger number of students to enter the dental profession. It began by enabling 144 ex-Service men to continue courses of training which they had entered upon with the help of grants from the Board of Education and up to the end of last March the Dental Board had awarded 348 other bursaries. At that date 247 of these 492 assisted students had qualified and 213 of the new diplomates are known to be satisfactorily settled in practice. The Board has also made loans of a total amount of nearly £3000 to 51 students in the final stages of their courses and of this money some £2300 has been repaid. Seven years ago Sir Francis propounded the following question: if before the war the annual entry of about 250 students maintained a practising list of about 5000, how large an annual entry will be required to maintain a practising list of about 13,000? The Dentists Register now contains about 14,000 names, while the annual entry to dental schools is only about 250. If the Register is to be maintained at this number with so limited an entry the average practising life of a dentist, as Sir Francis pointed out, must be extended to over 70 years, which, as Euclid might have said, is absurd. The truth is that an annual entry to the dental schools of well over 500 is required to keep up the Register. The anxieties of the retiring chairman of the Dental Board will be shared by many who are equally concerned with him for the dental health of the nation, although they may not have the accurate information which has brought the Dental Board to this conclusion.

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[1] Rev. Belge des Sci. Méd., 1929, i., 97.

[2] Medical Journal of Australia, March 30th, 1929.

THE WELSH NATIONAL MEDICAL SCHOOL.

THE renaissance of the Welsh National Medical School is likely to be the outcome of the final discussions between the Cardiff Royal Infirmary and the University College of South Wales and Monmouth, which are taking place as we go to press. The basis of the agreement is that the unit system is to continue unchanged, but that the clinical curriculum of the students will be settled by a Board of Clinical Studies on which the infirmary staff will be adequately represented. It would serve no good purpose to recapitulate the events which led to the disruption of this school at the very moment when its status had been settled and its active development was to be anticipated. But confidence in the future of an institution which aspires to the dignity of a national medical school will only be restored if the conditions of the agreement include a substantial guarantee of stability. The success of any teaching school must ultimately depend on the goodwill of individual members of the hospital staff, and their willingness to coöperate in the educational side of the hospital's work must be assumed when they undertake the charge of patients within its walls. It is our sincere hope that any arrangements made for the reopening of a clinical school in Cardiff will be founded on a firm basis and that such provision will be made for the adjustment of future difficulties of organisation as will at least safeguard the interests of the students.

IN the General Election which is taking place as we go to press 37 medical candidates are submitting themselves for election. A candidate whose name has not yet been mentioned in our columns is Dr. John Fraser Orr, a general practitioner in Winchburgh, who is standing as a Liberal for Linlithgowshire.

Major-General H. B. Fawcus has been selected to succeed Lieut.-General Sir Matthew Fell, who is retiring at his own wish, in September next, from the post of Director-General, Army Medical Services. Colonel W. R. Blackwell, late Royal Army Medical Corps, will succeed Major-General Fawcus as Deputy Director-General, Army Medical Services.

Two important benefactions to medical schools have been announced this week. Lord Beaverbrook has undertaken to pay £63,000 to St. Mary's Hospital Medical School in seven annual instalments, while the Edinburgh University Court will receive £20,000 from the trustees of the late Sir William Dunn, and £35,000 from the Rockefeller Foundation towards the internal reconstruction of buildings at Teviot-place, Edinburgh.

GROSVENOR HOSPITAL FOR WOMEN.—The new nurses' home at this hospital in Vincent-square, Westminster, was opened recently by Princess Louise, Duchess of Arygle. Last year 524 patients were admitted. The annual report points to the average length of stay of 20·5 days as illustrating the serious nature of the operations, and it is recalled that the King's Fund statistics show that, in comparison with similar institutions, the Grosvenor Hospital is the lowest in cost per bed.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XXXII.—PYELOGRAPHY.

WITH ILLUSTRATIVE PLATE (*Facing p. 1135*).

THE practice of filling hollow cavities—viscera, sinuses, &c.—with shadowgraph media and obtaining on an X ray plate a silhouette photograph, has constituted one of the most remarkable of modern advances. When employed to outline the renal pelvis it is termed pyelography and this form of examination has become one of the most valuable of the numerous diagnostic weapons now at the disposal of the urologist. It has actually been available for nearly 20 years, but the fact that until comparatively recently the recognised solutions have involved some element of risk to the kidney has restricted its employment to the most difficult cases. Safer media are now happily available and pyelography is freely undertaken in almost all types of renal disease and also, where symptoms are anomalous, for the purpose of excluding renal disease. Its use is to-day almost ubiquitous and indeed in the absence of facilities for pyelography the standards exacted by modern urology cannot be satisfied.

Technique.

A ureteric catheter is passed up one or both ureters as considered advisable. It is radiographically opaque so that it may be identified on the X ray plate and thereby show—

1. Its relationship to shadows seen in any previous radiogram.
2. How far it has been passed, and to what extent, if any, it has been responsible for the production of any displacements or kinks which may be seen in the ureter.
3. In the event of its having failed to reach the renal pelvis, whether this failure may result from kinks or other obstruction and whether it may account for any difficulty experienced in filling that structure.

Small catheters are selected as an additional precaution against over-distension of the kidney. They do not completely fill the ureter and therefore any excess of fluid can find a ready egress along the side of the catheter. On many plates peristaltic waves of this fluid may be observed passing down the outside of the instrument and thus producing a ureterogram.

A 13·5 per cent. solution of sodium iodide as recommended by D. F. Cameron is the most popular medium. It has good opacity, is non-irritating, non-viscid and, except in highly susceptible persons, is non-toxic. It is easily sterilised and has an osmotic pressure similar to that of the urine. I inject with a record syringe and this, if used with care and a knowledge that over-distension is to be avoided, is a perfectly safe method and has the great advantage of simplicity.

The operation is performed without anæsthesia in the female and under sacral anæsthesia in the male, a general anæsthetic being contra-indicated first, because the sensations of the patient are the best guide to when the danger point of distension has been reached, and secondly, because it is imperative that the patient shall hold his breath during the taking of the radiogram. Otherwise the picture will be blurred and a blurred image often leads to misinterpretation. The fluid is injected very slowly and the patient is asked to say if any abnormal sensation is experienced. In order to avoid apprehension on the part of the patient, one never refers to it as pain, and to eliminate suggestion the anticipated site is not indicated. Dilatation should be continued to the point of mild discomfort, but it must be remembered that the pain of pelvic distension (which is colicky in nature) has a long latent period so that if the injection is made too rapidly the correct point may be passed before the patient experiences any discomfort. When discomfort is acknowledged the patient is interrogated to discover if he recognises this as comparable in type or situation to that which he has previously experienced (if any).

Till recently I admitted most patients to the wards for pyelography, but now am more prone to save time and beds by undertaking it on the same occasion as the routine cystoscopy in the out-patient department and our patients have not thereby suffered any untoward experiences. After the bladder has been examined it must be decided whether the ureters shall be catheterised with large catheters for the purpose of separating the urines or with small ones for pyelography. The two operations should not be performed with the same catheters. If, however, the dye test will serve to estimate renal function it is well to employ it, and before the vesical medium is too discoloured a catheter is slipped into the ureter. In this way we combine the advantages of a dye test, which is usually sufficiently accurate, with those of a pyelogram.

The Normal Pelvis.

There are many variations of the normal pelvis but Fig. 1 is selected as particularly characteristic. Its trumpet-like contour and the calyces which adorn its outer margin are well seen. In the most usual type the triangular shape of the pelvis is well marked, and it receives above the upper calyx, below the lower, and at a point near its centre one or more shorter ones. The goblet-like shape of the calyces is here beautifully portrayed, notably in the upper member of the middle group. The primary or major calyces—i.e., the main stems adjacent to the pelvis proper—follow the common arrangement in being thicker in the upper and lower calyces and finer in the middle groups. The secondary or minor calyces are formed by the expanded extremities of the primary ones and are moulded over and receive the apices of the renal papillæ. In this instance they are multiple in the upper and lower groups whilst the middle ones are duplicated. This, however, is not constant as may be seen by examining other films.

Some calyces lie in the antero-posterior plane. They then appear end on, so that the major calyx, always actually short, vanishes entirely and the minor is seen as a circle. Such a minor calyx is shown in the lower pole of Fig. 1. If stereoscopic photos are obtained it can be ascertained whether these face forward or backward and the impression produced is that of looking into the depths of the chalice.

Emphasis has been laid by some writers on the regularity and shapeliness of the sweep made by the junction of the lowest calyx and the ureter, the so-called uretero-calycine curve. An examination of a series of normal pelves will show that this curve is variable and I personally attach little value to its appearance.

Dilatation.

It is convenient to discuss the results of renal distension before touching on congenital deformity. With a long narrow exit like the ureter it is not surprising that the outlet is prone to obstruction. If the obstruction is of more than fleeting duration an impress is left on the kidney which can be recognised pyelographically. Evidence of renal distension is extremely common when looked for by this examination. It results from intra- or extra-ureteric blockage and from plugging of the pelvic outlet however caused. The symptoms which it produces constitute the syndrome known as renal colic. When a patient complains of colic, stone is the explanation which jumps to the mind. It is the provisional diagnosis which usually accompanies him when he is referred to the surgeon for investigation. Yet it is actually one of the less frequent causes of colic, a fact which is insufficiently realised by the profession. Renal colic denotes renal distension and may be due to stone but is more probably due to some other cause, that cause being as a rule recognisable by pyelography. This was the province to which pyelography was first applied.

Figs. 2 and 3 show X rays of minor degrees of pyelectasis. The minor dilatations produce pain not less in severity than the greater ones, for behind them lies the full production of a kidney in nearly complete vigour, whilst behind the major ones is in many instances a mere shell of renal parenchyma. The latter can, moreover, be felt as tumours in the loin, whilst the former are too small to be palpated and can indeed be diagnosed by no other method than pyelography, for even at exploratory operation they are liable to be overlooked in so far as the distension occurs within the renal sinus and therefore out of sight. Pyelography thus assumes great importance in these early cases.

The effects of distension are well seen in Figs. 2 and 3. The former is from a movable kidney with pyelectasis. Note that the calycine extremities have become expanded, that the cupping has disappeared, and the concave outline has been replaced by a convex one (clubbing), whilst the major calyx has lost its customary slight waist. In this as in most other examples of early renal distension the incidence of pressure has shown itself to be most effective on the renal poles, the middle calcyes retaining their distinctive shape for a longer time. Fig. 3 was from a case in which infection played a part. When this happens dilatation may result from one or more of the following factors:—

(1) Simple mechanical dilatation from plugging of the outlet with inflammatory products.

(2) Ulcerative processes occurring at the apices of the papillæ.

(3) Abscesses originating in the parenchyma which on bursting into the pelvis retain some communication with that structure. This is best seen in the case of tuberculous disease (in which disease, however, I consider pyelography to be contra-indicated).

(4) Inflammatory weakening of the pelvic wall.

The effects of inflammatory dilatation are more polymorphic than those of simple dilatation and would be more difficult to interpret were it not for the fact that the clinical recognition of the renal infection assists in the interpretation of the pyelogram even more than is the case with other diseases.

Observe how the catheter has curled itself up in each pelvis. The diagnosis of a dilated kidney is often suggested by a catheter passing further than usual as occurred on the right side in this patient. The left kidney is a normal one but is not completely filled with solution.

Renal Stones.

The two following illustrations (Figs. 4 and 5) have been selected to show the advantages of pyelography in cases of renal stone. When a previous X ray has shown a shadow, its relationship to the urinary tract may be displayed by pyelography. If the shadow has a doubtful origin X rays in inspiration and expiration or stereoscopic plates may then decide its exact situation. Fig. 4 shows multiple renal stones on the right and a large hydronephrosis on the left side. Three renal stones had been diagnosed by a previous X ray. By overlaying the plates their position is identified and is dotted in on this plate. The right kidney pelvis is quite definitely distended as a result of being occupied by stones. At cystoscopy indigo-carmine was delayed to 7 minutes on the right side (3½ to 4½ minutes is the normal time before excretion) and was then feebly excreted, but on the left side no dye was observed during 15 minutes. Bilateral pyelography showed the relation of the three stones to the kidney pelvis. On the left side there is a very large hydronephrosis, the lower limit of which is identified by the transverse trickle of fluid opposite the bottom of the third lumbar vertebra. The rest of the solution has gravitated to the sump of the hydronephrosis where it has formed a pool. The size of the sac can be surmised. It has a vertical measurement of not less than 4 lumbar vertebræ. Only 7 c.cm. of sodium iodide solution were employed on the left side in making this film and no further distension was attempted as the diagnosis was thereby established. Had more fluid been used it might have had the effect of provoking an attack of retention in the hydronephrosis with undesirable consequences. An X ray taken three days after this one showed the sac to be clear of sodium iodide. Large sacs can generally be adequately recognised without fully distending them and it is better to avoid such distension. Fig. 5 shows a stone in a horse-shoe kidney. This discovery of the kidney deformity was invaluable as it forthwith became evident that the kidney could not be elevated on to the loin. The plate shows a low-lying, misshapen, dilated pelvis, situated abnormally close to the mid-line and showing calyces facing inwards. The ureter crosses the lowest calyx. These features are all characteristic of this deformity. Calyces lying to the inner side of the ureter always suggest a horseshoe kidney.

Duplication of the Ureter and Renal Pelvis.

Fig. 6 shows duplication of the ureter and renal pelvis. Catheters occupy each ureter. This pelvis is true to the invariable rule that the upper pelvis is smaller, often rudimentary, and has few calyces, whilst the lower is more complete, larger, and has better formed calyces. Congenitally ill-formed organs are quite common; they occur in about 3 per cent. of bodies. They are, however, found with undue frequency in urological practice as their abnormality appears to render them disproportionately susceptible to disease.

Renal Neoplasm.

In Fig. 7 a large renal neoplasm has developed in the upper pole of the kidney. The pelvis occupies a position opposite to the iliac crest, having been displaced downwards by the overlying growth. The upper and middle calyces and the upper part of the pelvis have been occupied by the neoplasm and are missing on the pyelogram. Deformity in renal growths varies according to the site of the growth, for instance, if the lower pole is involved it is the lower calyx which first disappears. The kidney then retains its normal position, but the ureter may be displaced inwards by the tumour.

Congenital Cystic Disease.

In congenital cystic disease (Fig. 8) the pyelographic deformity has much in common with that caused by renal growth and the two may easily be confounded. The former disease, however, is always bilateral, so that cases of difficulty may be resolved by a double pyelogram, as also by renal function tests. In this figure, as in Fig. 6, a great enlargement of the upper pole, this time by cyst formation, has depressed the pelvis to the level of the iliac crest. Note how it has been deformed by the encroachments of cysts on its cavity and that one limb stretches out beyond its recognised bounds to serve parenchyma which has been dislocated by the cysts.

Conclusion.

For years we have been able to study separate renal function by various excretion tests and to collect the urine from each individual kidney and examine its organic and inorganic content. It is odd that the anatomical study of the pelvis of the kidney should have lagged behind these physiological and pathological studies, but now by pyelography we have made good the defect. The renal function and chemical tests will tell that a kidney is wholly or in part out of action but may omit to say why. The latter not infrequently rectifies this omission. Renal function testing and pyelography are mutually interdependent; they are sister examinations and of these the younger bids fair to win a place not less important than that held honourably through many years by the elder.

J. B. MACALPINE, F.R.C.S. Eng.,
Honorary Surgeon, Salford Royal Hospital.

Special Articles.

INTER-STATE POST-GRADUATE ASSEMBLY OF NORTH AMERICA.

VISIT TO LONDON, MAY 27TH–29TH, 1929.

INAUGURAL ADDRESS.

THE session on Monday, May 27th, was opened by Sir JOHN BLAND-SUTTON who gave a short address of welcome to the delegates at the house of the Royal Society of Medicine.

It is ordained, he said, that I should welcome the members of this Assembly. In the autumn of 1927 I was present at the meeting in Kansas City, took part in the proceedings, and realised the importance of this great organisation. There never was a time when it was so necessary for medical men in active practice to keep themselves informed of the progress in the arts and sciences ancillary to medicine. The proud position of surgery is a consequence of discoveries in chemistry which supplied the means for inducing anæsthesia—the conquest of pain, which was the starting-point of modern surgery. The conquest of sepsis followed and helped to raise surgery from a craft to a beneficent art.

Improvements in the microscope enabled men to see the minute organisms which provoke disease in plants and animals, and revealed the astonishing fact that germs of disease and death lie hid in the smallest of living things and are conveyed to plants and animals by unsuspected carriers. The invention of clever instruments laid the foundation of specialties. Two of them were invented by non-medical men: the laryngoscope by a singer, Manuel Garcia; and the ophthalmoscope by a physiologist, Helmholtz. It is recorded that when von Graefe saw the fundus of the living human eye with its optic disc and blood-vessels, he flushed with excitement and exclaimed "Helmholtz has unfolded for us a new world." I spent a session in Arlt's eye klinik at Vienna in 1881 to acquire facility in using the ophthalmoscope. I foresaw that it would render valuable aid in the diagnosis of disease elsewhere than in the eye.

The incandescent lamp is a most useful clinical instrument. Any hollow organ in man's body can be illuminated by it. When watching a colleague rescue some false teeth from a woman's gullet with the aid of an œsophagoscope I suggested to him that the instrument required to be used by a surgeon with the instinct of a sword swallower and the eye of a hawk! The incandescent lamp was followed by X rays which render living bodies diaphanous and transformed the methods of dealing with broken bones. No surgeon who values his reputation and the patient's welfare trusts to tactile impressions in the detection of fractures. An X ray picture reveals such injuries to patients, friends, and solicitors as well as to doctors!

Our debt to optical glass is very great; photography requires flawless lenses. The progress of radiography leads us to believe that it may become possible to make cell-elements visible in human bodies as in the familiar experiment of watching red corpuscles whirling through the capillaries in the web of a frog's foot. When I was a boy microscopists wrangled about the shape of these corpuscles. To-day clinical observers describe almost as many varieties of erythrocytes as there are races of men.

Metchnikoff, a Russian biologist, discovered the defensive powers of leucocytes. His wife has described the simple way in which this discovery was made. Metchnikoff was at Messina and had been watching the mobile cells in the body of transparent star-fish larva, and the idea occurred to him that such cells might serve in the defence of the organism against intruders. To test this idea he took some thorns from a rose tree and introduced them at night under the skin of some beautiful star-fish larvæ—these larvæ are as transparent as water. "In the morning the thorns were surrounded by mobile cells as is to be observed in a man who runs a splinter in his finger." This simple experiment laid the foundation of phagocytosis, a theory to the development of which Metchnikoff devoted 25 years of his life. His first paper on phagocytosis was written in Odessa in 1883. He propounded his theory to Claus and other colleagues at Vienna, and asked a Greek equivalent for devouring cells. The name phagocyte was suggested and adopted.

In 1886 at the Royal College of Surgeons of England I delivered a lecture on Inflammation as a Zoological Process, and in the light of Metchnikoff's discovery I ventured to describe the action of leucocytes in relation to bacteria as amœbic warfare. In this room a year ago Dr. Canti showed an astounding film, a combat between phagocytes and bacteria. We may hope some day, with the help of X rays and the microscope, to detect the exotic fauna of the blood in living patients and watch trypanosomes, spirochætes, filariæ, and the like disporting in the blood stream, jostling erythrocytes like minnows and tadpoles in a brook. Young guinea-worms have been detected migrating through the subcutaneous tissue like eels wriggling in the grass seeking a pond.

It is an advantage, Sir John concluded, to meet annually and hear masters of the craft expound their methods. Operative procedures change so rapidly that text-books on surgery become like railway time-tables, useful only for a season. The meeting of the Inter-State Assembly keeps its members in touch with the almost kaleidoscope changes in every department of practice.

Dr. **JAMES COLLIER** then gave an address on

EPILEPSY.

A number of conditions, such as rickets and cranial injury, might, he said, give rise to a lifelong epilepsy indistinguishable from true epilepsy and manifesting every known phenomenon of epilepsy proper. Not one of these causes, however, invariably produced these convulsions, so that there must be some other determining factor. This was connected with the chemical processes of the body; all epilepsy was a disease of metabolism. The metabolic error might exist in birds, in all mammals and in man. There were three classes of individuals: (1) those in whom no sort of aggravation would cause epileptic manifestations; (2) those who would develop them more or less readily from any of the known causes, the potentially epileptic; and (3) those who developed epileptic manifestations spontaneously. The error was most likely to develop in infancy and childhood and least likely at the zenith of life; it might be now present, now absent, and could be removed by the metabolism of a second individual, as when the epileptic woman had no seizures during her pregnancy. It was very difficult indeed to make an animal or man epileptic by injuring the brain unless the individual were potentially epileptic to begin with. Only 4-10 per cent. of severe cerebral injuries during the war had resulted in epilepsy. Recent experiments had shown that one-seventh of the dose of wormwood oil required to cause convulsions in normal cats was sufficient to produce them in cats whose brains had previously been damaged, and that a minimal dose would produce strictly localised convulsions corresponding with a cerebral injury. There had been six cases of pre-frontal tumour at the National Hospital, Queen-square, ending in status epilepticus as sole symptom.

The stability of the hydrogen-hydroxyl ratio varied in different people, and convulsions had long been known to result from alkalosis. Occasionally patients being treated with alkalis would pass suddenly into status epilepticus with very high blood-urea but with normal chloride content of the cerebro-spinal fluid, thus excluding uræmia. Severe tetany—which was closely allied to epilepsy—might also occur in the course of alkali treatment. Epilepsy therefore might be produced by alkalosis, and if alkalosis were artificially induced in a series of epileptics of all kinds by hyper-ventilation, 60–80 per cent. of them would in half a minute have a convulsion, probably a severe one. Thus even temporary alkalosis was a potent exciting cause. In the same way tetany could be provoked at will by hyper-ventilation in some subjects. At the moment of onset of the fit the brain became blanched, flushing again with the convulsion. This must mean a sudden drop in blood pressure followed by a rise. The initial drop might account for the swiftness of the onset. These facts being established, the convulsive element might be regarded as a response to the grave threat to the organism constituted by alkalosis and fall of blood pressure; it offered a powerful check to both, and if it failed it was repeated. If even status epilepticus was unavailing, Nature abandoned the struggle and the patient, though free from convulsions and perfectly conscious, slowly died with increasing pulse, temperature, and blood-urea.

Migraine was also very like and might alternate with epilepsy, and intermediate conditions occurred. Syncope was a most mysterious and interesting event; and there was a sudden or slow drop in blood pressure associated with a real convulsion, however small. The most valuable treatments, both for migraine and syncope, were those used in epilepsy. Dr Collier described a case he had recently seen which had convinced him that the epileptic attack might be initiated in other parts of the brain besides the cortex. Epileptic manifestations were nowadays regarded from the point of view of loss of function; the "gunpowder and match" theory was gone for ever. The best treatment was a perfectly normal life; education, work, and pleasure should never be stopped. The "epileptic diet" might do more harm than good. Extensive biochemical research was needed.

Mr. **VICTOR BONNEY** spoke on

GYNÆCOLOGY.

He advocated *myomectomy for fibroids*, emphasising the reasons why the uterus should be spared if possible. The number of fibroids did not matter at all, but those on the front were much easier to deal with than those on the posterior wall. It was essential that the incision should be single and anterior. Posterior fibroids could be removed through an anterior incision by sidetracking through the muscle or viâ the cavity. Often the capsule of a large posterior one could be pulled right over the fundus like a hood and sutured anteriorly. The reason for the anterior scar was the grave risk of adhesion to intestine. Oozing into the utero-vesical pouch did not matter. If a posterior wound was unavoidable, the risk might be lessened by stitching the colon or the mesosalpinx lightly to the wound. No two cases were exactly the same and each called for ingenuity. The great danger of the past—hæmorrhage—had been obviated by the special clamp he had devised to encircle both urine arteries above the broad ligaments.

In speaking of *carcinoma of the cervix*, Mr. Bonney referred to the report of his paper published in THE LANCET last week (p. 1090), and emphasised the fact that more lives would be saved by surgery combined with radium than by radium alone, provided the operation were properly performed. It was a specialist operation, but any surgeon could learn to do it.

When investigating *sterility*, he said, he never inflated tubes in the consulting-room, partly because of the possibility of error when the patient was conscious and restless, and partly because he thought a woman should not be told she had closed tubes unless something could be done about it. He was not sufficiently convinced that inflation alone would promote conception. He demonstrated the apparatus he used, which had never failed him. If one squeeze of the bulb failed to pass air through the tubes he packed the tube in the cervix with gauze and opened the abdomen. A nurse then squeezed the bulb and he watched how far the air went. Air could also be blown through the abdominal ostium, and if it [illegible] down into the uterus the manometer on the cervical tube would record it even if it were inaudible. Retroversion only caused sterility through kinking the tubes; kinks might be very hard to find. If the abdominal ostium only were closed he slit it up, avoiding ligatures if possible. If the uterine ostium were blocked he cut the tube right off, snipped away until air would pass through, and then split the uterus across its fundus and sewed the tube in. It was not possible to pass anything into the uterus from the abdominal ostium and be sure of avoiding a false channel.

For *salpingitis* he advocated immediate operation and had never lost an acute case. Delay might mean involvement of the ovaries and an indefinite period of illness, as well as the danger of delaying an acute appendix or carcinoma through mistaken diagnosis. An acute appendix was operated upon immediately, why not a tube? He found that the people who opposed operation had never tried it. If the tube were knotty with blobs of pus on it, it should be removed; if soft and oozing a little pus only it should be drained and perhaps the ostium slit up. Only a small proportion of uteri gave subsequent trouble, and it was time enough to do a hysterectomy when the need arose. The less that was done in the acute stage the better. He disapproved of a purely vaginal operation, and thought a vaginal drain in addition to an abdominal one was superfluous.

Dr. H. C. SEMON spoke on

SOME PATHS OF PROGRESS IN DERMATOLOGY.

The jungle of eczema, he said, had undergone considerable clearance. The exogenous type was usually weeping; the superficial epidermal cells only were activated. When the irritant was endogenous every element in the cutaneous structure became a battlefield between the antigen and the specific cutaneous antibodies, and all the appendages of the skin might be involved. The difficulty usually lay in localising the septic focus. In erythema multiforme and nodosum it was usually a hæmolytic streptococcus in the buccal cavity, and apical abscesses associated with intestinal stasis were the most common cause of acne varioliformis and chronic furunculosis. X rays—especially negative reports—should not be trusted too much in suspected dental abscess. The possibilities of the tonsil, sinuses, and intestines should not be forgotten. Urticaria usually arose from an altered bacterial content of the intestine, and might be a symptom of grave metabolic disturbance, as might also pruritus.

X rays as a form of treatment were a two-edged sword, only to be used by a skilled technician under the constant observation of the dermatologist. The results of over-dosage were grave. While the indications were still somewhat vague, the contra-indications were now fairly definite. X rays should never be used in lupus, psoriasis, or hypertrichosis, and with the greatest caution only in pruritus of the genitals. There was no individual idiosyncrasy to X rays. In sunlight and its artificial substitutes we had an aid which had no real dangers except for the possibility of lighting up a hidden tuberculous focus—and in which the patient was the best judge of overdosage. Lupus vulgaris melted like the proverbial snow before proper heliotherapy in the Swiss Alps, but even the lamp substitutes available in this country had excellent results in all kinds of tuberculides, many septic lesions, including acne, boils, and carbuncles, and in chronic intractable sycosis. Vaccines were disappointing, and non-specific protein therapy, especially milk preparations, were just as useful as streptococcal vaccines or sera and were quite harmless. Chronic urticaria and dermatitis herpetiformis responded particularly well to autohæmotherapy, which was also useful for boils, pruritus, and obstinate eczema. For resistant cases more violent shock therapy in the from of TAB vaccine could be tried. Septic or allergising foci should always be removed before vaccines were used. Intravenous sanocrysin or other gold salts had proved a valuable new weapon for lupus erythematosus; the patient should be watched for toxic effects. In psoriasis there had been no advance since the days of Hebra, and Dr. Semon, after trying all the treatments advocated, had returned to inunctions of chrysarobin. Psoriasis was the most formidable problem and most outstanding reproach of modern dermatology. For extensive seborrhœic eruptions, psoriasis, and eczema, for which no cause could be found, the elimination treatment was useful, especially for stout middle-aged men who were fond of their port. Dermatology was tending more and more to return to the fold of general medicine.

On May 28th the chair was taken by Sir JOHN BROADBENT, and Mr. J. E. H. ROBERTS spoke on

INTRATHORACIC SURGERY.

Collapse of the lung in bronchiectasis and pulmonary tuberculosis, he said, could be procured in two stages: 1. By division of the phrenic nerve in the neck. This was always done before a thoracoplasty as it improved the patient's condition and gave an idea of what the effects of collapse would be. The diaphragm rose about two and a half inches and compressed the lower lobe very considerably. 2. By extrapleural paravertebral thoracoplasty, in which the ribs should be removed from the tip of the transverse processes. Partial thoracoplasty had been given up. Collapse was produced in three ways: the anterior part of the ribs was pushed back when the posterior part was removed, the anterior ends of the upper ribs dropped and the lowered ribs buckled down. Local anæsthesia was not advisable, for injecting the nerves caused rather than prevented post-operative pain, and shock could be obviated by attention to hæmostasis, careful preparation (including administration of salines, glucose, and morphine), and above all by careful handling. There was no need to hurry the operation under nitrous oxide and oxygen; 25 minutes was an average time. Mr. Roberts showed a series of X rays and photographs of illustrative cases, many of them showing how mistaken diagnoses might be made, and the importance of a preliminary bronchoscopy to make sure that the lung was not bound down by granulation tissue. Bronchoscopy, creosote chamber, and inversion make all palliatives and should always be tried before collapse therapy.

In Mr. Roberts's view collapse therapy was used too little and too late. The phrenic nerve should be divided as soon as bronchiectasis was diagnosed in one lobe. Abdominal surgery had reached its high standard of results because the surgeon operated in the early stages.

Intrathoracic tumours often went undiagnosed. An accurate history was the first essential, followed by thorough physical examination, including search for glands and for the effects of pressure on nerves. The next process was radiography in antero-posterior, true lateral, and oblique positions, with screen examination. Sputum tests came fourth and blood tests fifth in importance. The hydatid skin reaction and bronchoscopy followed, and when an artificial pneumothorax had been induced thoracoscopy might teach a good deal. Biopsy and exploratory operation completed the list. Mr. Roberts then showed slides illustrating these points. X rays, he pointed out, by no means always gave the correct diagnosis. Fibrotic calcified breasts, subpleural tuberculous abscess, hæmatoma, and tumours of the ribs projecting inwards might all simulate intrathoracic tumour under X rays. Fibromas consisted of fibrous tissue and a little unstriped muscle; they caused death by pressure and were removable. Dermoids might be mistaken for tuberculosis; their usual position was in the anterior or middle mediastinum. Mr. Roberts had had five cases of traumatic inclusion dermoid—pieces of metal or bone driven into the lung by war wounds had been enclosed in a capsule lined by squamous epithelium. In the diagnosis of hydatid cyst eosinophilia was unreliable; tests for a specific antigen were helpful but uncertain. Fifty per cent. of aneurysms did not pulsate when watched on the screen. The operative chances in intrathoracic malignant growths were very poor; the future lay with radium therapy.

Sir WILLIAM WILLCOX spoke on

CHRONIC RHEUMATISM AND THE TOXÆMIC FACTOR.

It was generally admitted, he said, that most forms of rheumatism were caused by toxæmia. Physicians were constantly dealing with diseases of which the cause was still to seek, and he had been trying to find the toxæmic cause of several common conditions. "Focal sepsis" was not a satisfactory term, because the infection might be more widespread than a focus; it was often a "surface sepsis" of an entire mucous membrane. He attached great importance to sepsis and believed in starting treatment with a clean slate. Every patient should be systematically searched. The mouth should be X rayed, as an unerupted tooth might be septic. He showed a series of photographs illustrating the various conditions that might affect the teeth and jaws. An expert should investigate the tonsils, glands, and sinuses. The frequency of infection of nasal sinuses in patients with no localising symptoms was only just becoming recognised. An X ray was essential, since transillumination sometimes failed to reveal the disorder. In doubtful cases puncture could be performed without any risk. Infected antra were particularly common in diabetics. The bowel, gall-bladder, appendix, and urogenital tract should also be investigated bacteriologically and radiologically in obscure cases. The treatment of disease was really a problem in immunity which was a very delicate balance. Removal of a focus of infection did not produce immediate cure because the infection had usually spread beyond it. Symbiosis played an important part, especially in recurrent boils. If a patient with phthisis had septic teeth his phthisis was not likely to improve. Sir William Willcox then recounted some cases showing how systematic search for infection repaid the physician in difficult cases. A para-enteric infection (i.e., by one of the less common organisms of the typhoid group) was not uncommon in arthritis. In early cases of diabetes removal of the sepsis caused remarkable improvement and the patients could go back to practically normal diet; in long-standing cases there would be only an improvement in the carbohydrate tolerance.

In the course of the morning Dr. R. G. CANTI showed his cinematograph film.

MEDICINE AND THE LAW.

Patient in Public Ward: Successful Claim for Operation Fee.

IF a patient occupies a bed in the public ward of a hospital, can the honorary physician to the hospital claim a fee for performing an operation on the patient? His honour Judge Crawford, before whom the question came on May 13th in the Watford County Court, answered it in the affirmative in the following circumstances. Dr. John Alexander McKinnon, of Park-drive, Wembley, sued Mr. Thomas Cox for 25 guineas for professional services rendered. Dr. McKinnon stated in evidence that he had been called in by Dr. Elizabeth Jenkins to give his opinion on the condition of Mrs. Cox who was suffering from an internal complaint; he found an operation to be necessary; the patient was taken to the Wembley Cottage Hospital, and the operation—a matter of life and death—was entirely successful. Dr. McKinnon explained that, owing to the existence of a septic case in the private ward, it was necessary to place Mrs. Cox in the public ward; he gave his services gratuitously to the sick poor in the public ward, but he did not regard Mrs. Cox as a person needing charity. He added that when he discussed the question of fees with Mr. Cox, the latter said that, although not a rich man, he did not want charity. Mr. Cox, the defendant, said he was a railway employee and a member of the railway hospital fund, which entitled his wife and himself to free hospital treatment. He denied that he ever engaged the services of Dr. McKinnon, or that he had ever seen him before. The Secretary of the Wembley Hospital gave evidence that Mrs. Cox was throughout regarded as a public patient, and that the hospital received two guineas a week in respect of her treatment. Dr. R. H. Martin, chairman of the medical committee of the hospital, said that the rule of the hospital provided that a patient in the public ward should receive free treatment. The judge had presumably to address himself to the question of contract. Had Mr. Cox employed Dr. McKinnon? If so, was there any reason to exclude the ordinary principle of law that a professional man exercises his skill for reasonable reward? His honour, accepting (it would seem) the plaintiff's rather than the defendant's evidence on the question of employment, decided that Mr. Cox had employed Dr. McKinnon. Judgment was given accordingly for the plaintiff for the amount claimed and costs. The judge observed that he thought Dr. McKinnon had broken the hospital rules by charging a fee, but this was a matter for the hospital authorities to settle.

"Neurasthenic" in Poor-law Infirmary.

A Coroner's jury at the Steyning Union Poor-law institution, on May 24th, in recording its verdict of suicide while temporarily insane, expressed the opinion that the union infirmary was not a suitable place for a typical neurasthenic case where constant observation was necessary. The jury had been called by the coroner, Mr. F. W. Butler, because he thought the circumstances rather unusual. A man, aged 25, a market garden labourer, of Sompting, was taken to the infirmary in June of last year, suffering from neurasthenia. Unhappy with his surroundings he went home after ten days, and was afterwards more or less an invalid. In February this year he was repeatedly asking his mother to end his life, and as he became beyond control it was proposed to again take him to the infirmary. He declared he would never go there, and taking a clothes-line, barricaded himself in his bedroom. The police were telephoned for, and when the young man saw them approaching the cottage he jumped out of the window with the end of the rope attached to his neck. The police cut him down, and he was charged at Worthing police-court with attempted suicide, and was bound over on condition that he entered the Steyning Union infirmary. He was readmitted to the institution on May 1st and for a time had a special day and night attendant. He soon became normal, and was allowed in the general ward. On May 21st he died from injuries caused by falling from a balcony. Dr. G. F. L. Mitcheson said the man was neurasthenic, but in order to certify him he would have had to be able to put down queer things he had seen or done that he (Dr. Mitcheson) had himself witnessed. It was not sufficient for him to be told anything. The coroner: "You did not feel you could certify him as insane?" Dr. Mitcheson: "The Commissioners would not accept it." Dr. Mitcheson said in his opinion the infirmary was not a fit and proper place to send a case of this description. It was often done, but the conditions were not ideal at all. Acute medical cases should not be mixed up with neurasthenics. Dr. Mitcheson agreed that it would have been better to have sent the man to Portsmouth on remand, and to have asked the prison doctor to keep him under observation. The coroner said it always seemed to him that if a man attempted his life once and was still ill, he might do so again. It was very questionable if an institution, such as a poor-law infirmary, which was not a lunatic asylum—although he believed they had a considerable number of mental defectives there—was a suitable place for the care of such a case as they had been inquiring into, where they had not the means, in fact, to take care and look after such cases.

uterus the manometer on the cervical tube would record it even if it were inaudible. Retroversion only caused sterility through kinking the tubes; kinks might be very hard to find. If the abdominal ostium only were closed he slit it up, avoiding ligatures if possible. If the uterine ostium were blocked he cut the tube right off, snipped away until air would pass through, and then split the uterus across its fundus and sewed the tube in. It was not possible to pass anything into the uterus from the abdominal ostium and be sure of avoiding a false channel.

For *salpingitis* he advocated immediate operation and had never lost an acute case. Delay might mean involvement of the ovaries and an indefinite period of illness, as well as the danger of delaying an acute appendix or carcinoma through mistaken diagnosis. An acute appendix was operated upon immediately, why not a tube? He found that the people who opposed operation had never tried it. If the tube were knotty with blobs of pus on it, it should be removed; if soft and oozing a little pus only it should be drained and perhaps the ostium slit up. Only a small proportion of uteri gave subsequent trouble, and it was time enough to do a hysterectomy when the need arose. The less that was done in the acute stage the better. He disapproved of a purely vaginal operation, and thought a vaginal drain in addition to an abdominal one was superfluous.

Dr. H. C. SEMON spoke on

SOME PATHS OF PROGRESS IN DERMATOLOGY.

The jungle of eczema, he said, had undergone considerable clearance. The exogenous type was usually weeping; the superficial epidermal cells only were activated. When the irritant was endogenous every element in the cutaneous structure became a battlefield between the antigen and the specific cutaneous antibodies, and all the appendages of the skin might be involved. The difficulty usually lay in localising the septic focus. In erythema multiforme and nodosum it was usually a hæmolytic streptococcus in the buccal cavity, and apical abscesses associated with intestinal stasis were the most common cause of acne varioliformis and chronic furunculosis. X rays—especially negative reports—should not be trusted too much in suspected dental abscess. The possibilities of the tonsil, sinuses, and intestines should not be forgotten. Urticaria usually arose from an altered bacterial content of the intestine, and might be a symptom of grave metabolic disturbance, as might also pruritus.

X rays as a form of treatment were a two-edged sword, only to be used by a skilled technician under the constant observation of the dermatologist. The results of over-dosage were grave. While the indications were still somewhat vague, the contra-indications were now fairly definite. X rays should never be used in lupus, psoriasis, or hypertrichosis, and with the greatest caution only in pruritus of the genitals. There was no individual idiosyncrasy to X rays. In sunlight and its artificial substitutes we had an aid which had no real dangers except for the possibility of lighting up a hidden tuberculous focus—and in which the patient was the best judge of overdosage. Lupus vulgaris melted like the proverbial snow before proper heliotherapy in the Swiss Alps, but even the lamp substitutes available in this country had excellent results in all kinds of tuberculides, many septic lesions, including acne, boils, and carbuncles, and in chronic intractable sycosis. Vaccines were disappointing, and non-specific protein therapy, especially milk preparations, were just as useful as streptococcal vaccines or sera and were quite harmless. Chronic urticaria and dermatitis herpetiformis responded particularly well to autohæmotherapy, which was also useful for boils, pruritus, and obstinate eczema. For resistant cases more violent shock therapy in the from of TAB vaccine could be tried. Septic or allergising foci should always be removed before vaccines were used. Intravenous sanocrysin or other gold salts had proved a valuable new weapon for lupus erythematosus; the patient should be watched for toxic effects. In psoriasis there had been no advance since the days of Hebra, and Dr. Semon, after trying all the treatments advocated, had returned to inunctions of chrysarobin. Psoriasis was the most formidable problem and most outstanding reproach of modern dermatology. For extensive seborrhœic eruptions, psoriasis, and eczema, for which no cause could be found, the elimination treatment was useful, especially for stout middle-aged men who were fond of their port. Dermatology was tending more and more to return to the fold of general medicine.

On May 28th the chair was taken by Sir JOHN BROADBENT, and Mr. J. E. H. ROBERTS spoke on

INTRATHORACIC SURGERY.

Collapse of the lung in bronchiectasis and pulmonary tuberculosis, he said, could be procured in two stages: 1. By division of the phrenic nerve in the neck. This was always done before a thoracoplasty as it improved the patient's condition and gave an idea of what the effects of collapse would be. The diaphragm rose about two and a half inches and compressed the lower lobe very considerably. 2. By extrapleural paravertebral thoracoplasty, in which the ribs should be removed from the tip of the transverse processes. Partial thoracoplasty had been given up. Collapse was produced in three ways: the anterior part of the ribs was pushed back when the posterior part was removed, the anterior ends of the upper ribs dropped and the lowered ribs buckled down. Local anæsthesia was not advisable, for injecting the nerves caused rather than prevented post-operative pain, and shock could be obviated by attention to hæmostasis, careful preparation (including administration of salines, glucose, and morphine), and above all by careful handling. There was no need to hurry the operation under nitrous oxide and oxygen; 25 minutes was an average time. Mr. Roberts showed a series of X rays and photographs of illustrative cases, many of them showing how mistaken diagnoses might be made, and the importance of a preliminary bronchoscopy to make sure that the lung was not bound down by granulation tissue. Bronchoscopy, creosote chamber, and inversion make all palliatives and should always be tried before collapse therapy.

In Mr. Roberts's view collapse therapy was used too little and too late, The phrenic nerve should be divided as soon as bronchiectasis was diagnosed in one lobe. Abdominal surgery had reached its high standard of results because the surgeon operated in the early stages.

Intrathoracic tumours often went undiagnosed. An accurate history was the first essential, followed by thorough physical examination, including search for glands and for the effects of pressure on nerves. The next process was radiography in antero-posterior, true lateral, and oblique positions, with screen examination. Sputum tests came fourth and blood tests fifth in importance. The hydatid skin reaction and bronchoscopy followed, and when an artificial pneumothorax had been induced thoracoscopy might teach a good deal. Biopsy and exploratory operation completed the list. Mr. Roberts then showed slides illustrating these points. X rays, he pointed out, by no means always gave the correct diagnosis. Fibrotic calcified breasts, subpleural tuberculous abscess, hæmatoma, and tumours of the ribs projecting inwards might all simulate intrathoracic tumour under X rays. Fibromas consisted of fibrous tissue and a little unstriped muscle; they caused death by pressure and were removable. Dermoids might be mistaken for tuberculosis; their usual position was in the anterior or middle mediastinum. Mr. Roberts had had five cases of traumatic inclusion dermoid—pieces of metal or bone driven into the lung by war wounds had been enclosed in a capsule lined by squamous epithelium. In the diagnosis of hydatid cyst eosinophilia was unreliable; tests for a specific antigen were helpful but uncertain. Fifty per cent. of aneurysms did not pulsate when watched on the screen. The operative chances in

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Hospital Policy in Dublin.

A DISCUSSION has been going on for the past few weeks in the Dublin press, and in speeches delivered at annual meetings of hospitals, concerning the policy of amalgamation of some of the smaller Dublin hospitals. The first contribution came from Sir William Taylor, who, in an interview given to an evening paper, was reported as having said that by failure to agree to an amalgamation scheme a few years ago Dublin hospitals had lost a grant of a million and a quarter sterling from the Rockefeller Foundation. Sir William Taylor assigned to religious differences the failure to come to an agreement, quoting an official of the Rockefeller Foundation as his authority. (On a previous occasion, it may be remarked, the difficulties arising out of the question of the Medical Register were assigned as the cause of the reluctance of the Rockefeller Foundation to assist medical education in Dublin.) Sir William Taylor went on to deplore the relative position of Dublin in medical education to-day. "In the realm of medical science," he said, "the Irish capital is practically unknown to-day." Belfast was miles ahead of Dublin; they had the hospitals, the equipment, and the means to facilitate study—all these were lacking in Dublin.

Both divisions of Sir William Taylor's interview have roused criticism. It is generally thought that if there is any documentary evidence or correspondence about the reasons why the Rockefeller Foundation did not accede to the request made a few years ago, it should be made public. If there is not such evidence it would be better to refrain from offering hypothetical explanations of a nature likely to give offence. In his comparison of the Dublin with the Belfast School Sir William Taylor drew at once a protest from his colleague, Dr. T. G. Moorhead, the Regius Professor of Physic in Dublin University, in a speech delivered at the annual meeting of the Royal Victoria Eye and Ear Hospital. While declaring himself a convinced supporter of amalgamation of hospitals, Prof. Moorhead denied that Dublin had no place in modern medical science. Dublin, while unable to compete with such centres as London and New York, continued to make contributions to current scientific thought in proportion to its resources and population. Dublin suffered, perhaps, from the antiquity of some of its hospital buildings, but it had also ancient traditions and culture which formed the best basis for a modern outlook. In his opinion, as a teaching centre and as a school Dublin held as high a position as ever it did. Some days later Sir William Wheeler returned to the hospital question in a newspaper interview. He gave reasons for holding that the hospital question in Dublin required serious study, and also for his opinion that amalgamation was desirable. He suggested that a tribunal of business men and medical men should be set up by the Government to inquire into the whole question of hospital service in Dublin.

In a speech delivered at the Coombe Hospital Mr. W. Doolin made a spirited defence of the present system of small hospitals. He argued that the system not only had grown up to fit local conditions, but was, in fact, best suited to Irish needs. He claimed that each year the small hospitals of Dublin, by virtue of their intimacy and their number, turned out practically trained practitioners of higher average value to the national community than any other medical centre within his knowledge. The Irish dispensary doctor was a better equipped practitioner than his fellows in either Germany or France. He did not think that as good practical training could be given in a large hospital, and he believed that from the point of view of the patient, the care given in the small Dublin hospital was more effective than that given in the infirmary institutions of Paris, Berlin, or Vienna. The conservative arguments of a surgeon of so progressive a mind as Mr. Doolin should receive due weight, but it might be suggested that the disadvantages he foresees in large hospitals are incidental rather than essential, and are not unavoidable. He does public service, however, in drawing attention to them.

The Risk of Infection by Imported Clothing.

In the Dáil last week Dr. Ward drew attention to the risk of introducing disease, particularly small-pox, to the Irish Free State, by infected second-hand clothing. In reply, on behalf of the Minister for Local Government and Public Health, reference was made in the Small-pox (Importation of Clothing, &c.), Temporary Regulations, 1927. Under these Regulations which came into effect on Sept. 1st, 1927, and are still in operation, second-hand clothing, used bedding, and rags may only be imported into the Free State from Great Britain and Northern Ireland through the ports of Dublin, Cork, Waterford, or Galway, where it becomes the duty of the Port Sanitary Authority to undertake the disinfection of the articles and return them to the custody of the Customs and Excise Authorities. Exception is made in the case of (1) articles transmitted by the postal service or forming part of passengers' luggage; (2) goods in course of transit through the Free State to an outside destination, if suitably packed; (3) articles accompanied by a certificate of the medical officer of health of the place of origin in Great Britain or Northern Ireland or of the port of arrival in Ireland, that they have been efficiently disinfected; (4) articles accompanied by a certificate from a medical officer of health in Northern Ireland that they have not been imported from Great Britain.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

The Disaster at the Cleveland Clinic.

ON the morrow of the disaster at the Crile Clinic in Cleveland 124 deaths are reported and some twenty others are hardly expected to recover from the effects of the gas. The plumber who was investigating a leak in a steam pipe in the vault where X ray films were stored when the first explosion occurred is among the survivors. He was actually blown through the open door of the vault. The clinic building was considered a model of fire-proofing. In the *Modern Hospital* for January, 1925, are to be found side by side two articles, one in praise of the new Cleveland clinic building and the other urging the importance of fire-proof precautions in hospitals. At the time of writing it appears that two explosions occurred in the vault without the closure of the automatic door. It is probable that these explosions took place at a temperature below that which is necessary to melt the fusible iron and so release the mechanism.

The cause of poisoning is still uncertain, but analyses of the victims' blood have all shown hydrocyanic acid and bromine. The brownish gas observed by onlookers is thought by chemists to have been nitrogen dioxide. This would indicate that some at least of the films were made of cellulose nitrate. According to officials of the Eastman Kodak Company, films made of cellulose acetate are not more inflammable than paper, and would not have caused the explosions.

Eight doctors, including six staff physicians at the institution, lost their lives, the last being Dr. John Phillips, one of the founders of the clinic. He was in the building when the catastrophe occurred, but walked home, believing he had not been affected by the gas. He was taken ill towards evening and rushed to a hospital, where a blood transfusion was done by Dr. Crile. The men and women who were in the building at the time of the explosion, in addition to the doctors and nurses, were there for examination. The building is one of a group of three and is known as the examination building. Patients seldom are kept at this building for more than a day. After diagnosis they are assigned rooms in the Clinic Hospital, dismissed or removed to hospitals of their own choosing.

Many tales of heroism are told. The telephone operator remained at her post warning occupants of the building until she was overcome by the gas. She was removed to a hospital but died soon afterwards. Dr. Crile himself is reported to have worked for 29 hours without rest. "We must carry on," he says, in a statement issued on behalf of the board of directors of the foundation. "The clinic has its work to do and must go forward. The staff is prepared to carry on." A committee of prominent citizens has already given assurance that the material damage will be immediately repaired.

Physical Measurements of School-children.

Of the many authropometrical studies of school children made hitherto in this country, none has been confined to a single race. The Public Health Service have now commenced a survey which is to be classified according to nationality, and the first results are published for 30,000 children of white stock who classify as "old American" under Dr. Hordlicka's standard, that is—both parents and all four grandparents were born in this country. Since samples were taken from widely separated districts the results form a first standard of the size of young America. The results in weight, standing height, and sitting height (Dreyer method) are tabulated according to the age on the nearest birthday. A comparison of the rate of growth between boys and girls shows that the latter start to overtake the former at about ten years of age, and by the thirteenth year have surpassed them in weight, height, and chest circumference, though in vital capacity and in transverse chest diameter the boys maintain at all ages a supremacy. After 13, with the onset of male puberty, the boys gain rapidly and soon recover a lead in all measurements except weight.

Mortality in 1928.

Although the mortality-rates for the year have not yet been calculated by the Bureau of Census, provisional figures are available from the summing of monthly returns made by certain States to the Public Health Service. The death-rate from all causes (12·3) is higher than in 1927, but lower than in any of the four years 1923–1926. Tuberculosis (all forms) continued its uninterrupted decline from 80·4 in 1927 to 76·9 last year. On the other hand the death-rate from heart-diseases (228·4) is the highest yet recorded. This figure includes items 87–90 in the International List. Cancer also reached a new maximum at 104·8. The influenza death-rate is given as 37·5. This compares with 19·7 in 1927 and 35·9 in 1926. It is true that the influenza epidemic was still at its height when the year came to a close. However, the Metropolitan Life Insurance Company has a complete study of the epidemic for its policyholders, from which it concludes that "the recent outbreak was far less serious than the great pandemic, and that, as far as it is possible to judge, in no city did the 1928–1929 death-rate exceed 40 per cent. of that recorded in 1918–1919." The indications of the first quarter's returns in the present year are that the death-rate from alcoholism will reach a new high point this year. The Metropolitan's death-rate for the quarter is 3·8 as compared with 3·2 last year.

Venereal Disease in West Virginia.

The Venereal Disease Bureau of the West Virginia State Department of Health has completed a study of 13,000 patients at present receiving treatment in the 12 clinics which are connected with the Bureau. The mean age of infection for single females is found to be 17 years, and for single males 22 years. A special effort is being made, through the routine examination of school-children, to discover and place under treatment children suffering from hereditary syphilis.

Malaria in the Canal Zone.

The completeness of the triumph of medical science in the Panama Canal Zone is emphasised by a recent report from the health officer. In 1906 the malaria admission-rate among 26,547 employees of the Panama Canal was 821 per 1000, and the death-rate 7·45. There has not been a death from malaria since 1920, except for two deaths in 1924. Last year the admission-rate was only 14·2 per 1000. The average rate for the last three years has been 13 per 1,000 in a force having a mean strength of 13,517.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

THE following appointments are notified: Surg.-Comdr. L. W. Gemmell to *President*, for Medical Dept. Surg. Lt.-Comdrs. S. G. Rainsford to *President;* J. L. Edwards to H.M.H.S. *Maine;* and D. C. Eglington to *Pembroke.* Surg. Lt. (D.) A. W. Wallace to *Tiger.*

ARMY MEDICAL SERVICE.

Maj.-Gen. H. B. Fawcus, C.B., C.M.G., D.S.O., K.H.P., has been selected for the appointment of Director-General, A.M.S., on the retirement of Lt.-Gen. Sir Matthew H. G. Fell, K.C.B., C.M.G., K.H.P., in September next at his own wish. Col. W. R. Blackwell, C.M.G., will succeed Maj.-Gen. Fawcus as D.D.G.A.M.S.

ROYAL ARMY MEDICAL CORPS.

The undermentioned Lts. (on prob.) are confirmed in their rank: F. Welsh, H. Daukes, D. C. Ettles, and J. A. Timoney.

Lt. (on prob.) E. M. Hennessy from the secd. list is restd. to the estabt.

ARMY RESERVE OF OFFICERS (DENTAL CORPS).

J. W. Cooper, late Lt., 6th Bn. Welch R., to be Lt.

TERRITORIAL FORCE.

Maj. R. D. Cran, having attained the age limit, relinquishes his commn.

Capt. D. F. Dobson to be Maj.

B. M. Dick to be Lt.

INDIAN MEDICAL SERVICE.

Col. R. F. Baird retires.

The undermentioned officers relinquish their temp. commns.: Temp. Capts. Ram Mansoor, Ardeshir Ratanji Wadia, Mangharam Rochiram Lalvani, Bala Prasad, and Des Raj Kajuria.

DEATHS IN THE SERVICES.

Major-General Charles Edward Pollock, late R.A.M.C., who died on May 18th at his residence, Northwood, Middlesex, at the age of 61, was the son of Mr. Alexander Pollock, of Paisley, and received his early education at Wellington College. He afterwards entered at Guy's Hospital as a medical student and qualified with the conjoint diploma in 1891. He received his first commission in the Royal Army Medical Service two years later, and was promoted to captain in 1896, in which rank he served on the North-West Frontier of India in 1897–98, and was with the Tirah Expeditionary Force (medal and two clasps). In 1902 he served in the South African War, taking part in the operations in Orange River Colony and in Cape Colony (Queen's medal and two clasps). In 1904 he was promoted major, and when the late war broke out he was appointed A.D.M.S. of the 15th Division and D.D.M.S. of the IV. and VI. Corps. He was awarded the D.S.O. in 1917, created C.B.E. in 1919, and C.B. in 1921. After the war he was appointed a member of the British Military Mission to Berlin, and was afterwards A.D.M.S. in the Eastern Command and D.D.G.A.M.S. He retired in 1926. Major-General Pollock married Winifred, daughter of the late C. E. H. Jay, by whom he had a son and two daughters.

GERMAN RONTGEN SOCIETY.

CONGRESS IN AUSTRIA.

(FROM OUR VIENNA CORRESPONDENT.)

FOR the first time in its existence the Deutsche Röntgen-Gesellschaft held its biannual meeting in Vienna, and the 800 medical men who attended from April 20th–23rd comprised not only representatives from Germany, Austria, Czecho-Slovakia, Switzerland, and Hungary, but also a few from France and Italy. More than 200 papers were read, and there were also a large number of minor demonstrations, whilst a post-graduate course, lasting four days, was held at the close of the official meeting. The first paper was read by Prof. Berven (Stockholm) on the radiological treatment of tumours of the oral cavity. He emphasised the necessity of combining the use of X rays and radium in dealing with growths in this region. By this combination, he said, the energy of growth was markedly diminished, and the reactive powers of the organism could be strengthened. In Stockholm, where they have five grammes of pure radium-bromide, they got 66 per cent. of cures in tumours of the lips and 47 per cent. in tumours of the tongue, the criterion of cure being freedom from recurrence for at least five years.

Prof. Döderlein (Munich) maintained that radiological treatment in cancer of the uterus is at least as successful as surgical treatment, having the advantage of being free from danger whereas surgical treatment has high mortality. He has been working with X rays and radium in gynæcology since 1913, and already he can point to 10 per cent. of cures in desperate cases which surgeons have declared inoperable. In Munich 2000 women have so far been irradiated, with over 35 per cent. of cures lasting more than five years. Prof. Wintz (Erlangen) also combines X rays with radium treatment in cancer of the uterus and of the breast. As a preliminary he uses injection of copper salts and his results show permanent cure in 34 per cent. of cases. Prof. Lacassagne (Paris), who read a paper on the biology of irradiated cancer cells, also referred to the beneficial effect of radiotherapy in cancer of the uterus, and was seconded by Prof. Lahm (Chemnitz).

The methods used in Berlin and Kiel by Prof. Stockel were described by Dr. Mikulicz. They consist chiefly in applying an intensive dose of radium before the radical operation is performed; then at the end of the operation radium needles are inserted into the tissues and after full convalescence intensive X ray treatment is given. This method is rather tedious and very tiring both to patient and surgeon, but gives excellent results. In Würzburg, where Prof. Jauss and Dr. Neeff are working, they take great care to find out what *dose* of the rays is required for each individual case, this dose being soon found by Dr. Neeff's method. Dr. Bardackzi and Dr. Epstein (Prague) uttered a caution against too intensive irradiation of tumours, and Prof. Schwarz (Vienna) pointed out that experimental animal cancer behaves differently from human cancer, in that the latter shows no local immunisation after application of X rays. Schwarz suggests that the prophylactic and post-operative irradiations should be of the same dose as the main treatment, and holds that the earliest stages of cancer should not be treated by the radiologist, but by the surgeon.

The relations of radiology to dermatology were discussed by Prof. Freund (Vienna)—called the father of radiological treatment—and by Dr. Reisner (Frankfurt). Dr. Pordes (Vienna) applies X rays in acute inflammations of the subcutaneous tissues, with excellent results; Dr. Eisler has found them very useful in pruritus and prurigo, especially in elderly persons, and Dr. Wieser has obtained good results in therapy of post-influenzal affections of the brain.

The diagnostic value of X rays was discussed on the second day. The possibility of controlling the progress of improvement in tuberculosis of the lungs was demonstrated by Dr. Fleischner; the pathology of the thymus was dealt with by Dr. Lenk (Vienna), and Dr. David discussed radiological methods in aortic disease. The examination of the gastro-intestinal canal was the subject of a large number of papers presented to the congress. "The micro-method" (using small quantities of barium) for the intestinal canal, as demonstrated by Dr. Berg (Berlin), is especially designed for the diagnosis of changes in the mucous membranes; it shows the finer folds of the membrane. Dr. Grebe (Berlin) explained how to examine the gall-bladder by giving tetra-iodine-phenol-phthalein, and Dr. Roseno (Cologne) said he used the same substance to obtain radiograms of the uropoietic system, even better results being obtained with iodine-urethane, given intravenously. He claimed that this method allows photography of both kidneys simultaneously, radiograms being also obtainable in infective disease of the lower parts of the urinary system.

The third day began with a cinematographic demonstration of X ray stereography by Prof. Gottheimer (Berlin). He demonstrated in a surprisingly clear way the movements of the heart, the respiratory changes of the lungs, the rise and fall of the diaphragm, and the peristaltic movements of the œsophagus. Dr. Hintze (Berlin) showed distinct pictures of the diminished speed of healing after exposure to X rays, and was able to demonstrate, by cinematograph, the progress of healing of a facial cancer, the film showing a process which really lasted 400 days, in the course of 100 seconds.

Great interest was evoked by the papers of Dr. Pordes and Dr. Freund, of Vienna, who, in coöperation with the Japanese surgeon, Fukase, have observed the beneficial effect of prophylactic and therapeutic use of X rays in inflammation of various tissues. Dr. Hausmann showed the effect of the kathode rays upon the red blood corpuscules, and Dr. Kisch discussed the effect of X rays and electric-light combination in tuberculous affections, whilst Dr. Pincherle (Trieste) demonstrated his method of examining the brain and its blood-vessels. X rays are now used extensively in the teaching of anatomy in Vienna, and close attention was paid to Dr. Goldhammer's paper on this subject.

An exhibition of instruments, apparatus, and implements used in radiology and heliotherapy was held coincidently with the meeting. It gave an excellent opportunity of inspecting and studying the ideal equipment of the most up-to-date laboratory, and every visitor certainly got the impression that the outfit of a Rontgen institute is a very expensive affair.

RAILWAYMEN'S PAYMENT TO HOSPITALS.—The London, Midland, and Scottish Railway Hospital Fund disbursed £100,000 during last year to hospitals where railwaymen and their families receive free medical treatment. Over 1000 hospitals received grants, ranging in amount from £2000 to three guineas. When the fund was started 50 years ago the railwaymen contributed half a day's pay per annum. Now they contribute threepence a week, and the railway company contributes one penny per member. Last year's income amounted to £160,000.

JOINT TUBERCULOSIS COUNCIL.—At a meeting of the Council held at the House of the Society of Medical Officers of Health on May 18th the secretary for post-graduate study reported that 16 members of the tuberculosis service were now attending the arranged course in Paris. There were prospects of a course at Alton in July, and one on the interpretation of skiagrams in November. Consideration was given to a memorandum on the notification of tuberculosis and a proposal from Dr. Lissant Cox to have a single notification form so worded that it could be used for all purposes. It was decided to suggest an alteration in the present wording of the Tuberculosis Regulations so as to read: "Provided that a medical practitioner shall not notify a case of tuberculosis under this Article if he has reasonable grounds for believing that the case has already been notified, either under this order or under the previous Regulations or otherwise, *to the medical officer of health for the district within which the place of residence of the person is situate.*"

authorities, as to the prophylactic and curative values of irradiated milk in the treatment of rickets. If rickets can be controlled, the bearing of this on obstetric work and on child welfare and infantile health and mortality is profound and far-reaching. For some months past I have been investigating this subject with the coöperation of Dr. T. Y. Finlay, of the Child Welfare Department, Edinburgh, and Dr. J. B. King, of the Radiological Department of the Royal Infirmary, and the results of this inquiry, which will shortly be published, amply confirms the claims made by German authorities. The manner in which the use of irradiated milk controls the disorderly manner of growth of the cells characteristic of rickets is very striking, and opens up a vista of possibilities of far-reaching interest and importance.

If full advantage is to be taken of the possibilities of the moment, it seems advisable that a very broad and comprehensive view of the possibilities of radium and radiation be taken, not only in relation to cancer, but in relation to normal and abnormal nutrition and diseases arising therefrom. The admirable report of the Radium Sub-Committee deals with radium only, and is essentially restricted to cancer. This view is probably too restricted. The sum of £250,000 obtained as a radium fund is small in relation to the real needs of the situation. Assuming that one-eighth of this was available for Scotland, this sum, added to present available supplies, is certainly far short of what is required. It is also doubtless far short of what would be provided by the public for a comprehensive well-considered business-like scheme. The basis for any successful scheme is the recognition of the need for much thorough clinical research to be carried out primarily by experts, with the coöperation of clinicians. A question I would like to ask is, whether the experts have said their last word on the subject. What are their recommendations? Taking Scotland as a unit, is it not possible to devise a scheme, in which the four University teaching centres would coöperate, their scheme being allied to and part of a larger scheme?

Unless action is taken on some broad comprehensive lines there is reason to fear that only a fraction of the possible benefits to private and public health will accrue from the present movement.

I am, Sir, yours faithfully,

Edinburgh, May 26th, 1929. CHALMERS WATSON, M.D.

PATHOLOGICAL POSTURES.

To the Editor of THE LANCET.

SIR,—Dr. Walshe's confidence in the support of the decerebrate sloth is entirely misplaced. His point was that this animal's pathological posture had occurred "in response to the mode of life of the sloth itself and not in relation to its phylogenetic associations." (This, of course, does not logically exclude such an origin for pathological postures in other animals.) But he omitted to state the essence of my argument concerning the flexed upper limb in hemiplegia. I pointed out that this posture arose in monkeys and anthropoid apes in response to their adoption of an erect sitting attitude and was perpetuated in man as he developed and perfected the erect attitude for standing and walking. I concluded that the association of the flexed upper with the extended lower limb in hemiplegia was "the primitive human standing attitude." In other words, it was "the response to the mode of life of" man himself. Dr. Walshe has arrived on physiological grounds at the conclusion that the flexed upper limb in hemiplegia is a postural modification brought about by "the assumption of the erect posture." He regards his conception as "in accord with physiological principles" and mine as a "figment" and an "allegory." I do not think that unprejudiced critics will consider that there is much difference between them.

I am, Sir, yours faithfully,

Harley-street, W., May 20th, 1929. W. RUSSELL BRAIN.

CANCER OF THE COLON.

To the Editor of THE LANCET.

SIR,—The general excellence of the address given by Prof. Grey Turner on the above subject and reported in THE LANCET (May 18th and 25th) is, I am sure, obvious to all who have read it, and I hope he will not think my criticisms are made in anything but a fair and friendly spirit. I want to comment on three points which arise in his address—the incision, the blood-supply of the colon, and Paul's operation.

1. *The incision.*—Mr. Grey Turner says he strongly recommends direct exposure over the situation of the growth, using the oblique or transverse muscle-cutting incision of Rutherford Morison, as he finds adherent growths in the ascending or descending segments of the colon cannot be satisfactorily dealt with by the paramedian incision. This is not my experience; however adherent the growth may be it is quite easy to mobilise it from a paramedian incision made to the right or left according to the site of the growth. Perhaps in Leeds we are prejudiced in favour of this incision, because I believe Lord Moynihan is responsible for its introduction, as Mr. Grey Turner may be influenced by his association with Mr. Rutherford Morison. If there is no advantage to be gained by direct incision, as I maintain, then I think there can be no doubt as to which is the better one, as with the paramedian incision there is the minimum risk of a post-operative hernia, and the ensuing scar is much more satisfactory in every way. The only consideration which would make me use the direct approach would be an intimate blending of the growth with the anterior abdominal wall, where a large segment of this might need removing; this is only rarely encountered.

2. *Danger of insufficient blood-supply at the anastomosis.*—Contrary to the view expressed by Mr. Grey Turner, I believe that if sepsis occurs after an anastomosis is made in the colon it is almost invariably due to the spread of infection at the time of operation, and not to lack of blood-supply and consequent necrosis at the suture line. It is, in my opinion, almost impossible to deprive the colon of an efficient blood-supply, and I do not believe that the critical point of Sudek exists. If necrosis follows an anastomosis it is not due to the precarious supply of blood, but to the suture line being under tension, and as it is always possible to bring one or other side of the colon, or both, to the anastomosis quite free of tension by adequate mobilisation, necrosis should never be seen.

3. *Paul's operation.*—I am surprised Mr. Grey Turner should only make a passing reference to this operation in the treatment of carcinoma of the colon. The growth and glands are mobilised through a paramedian incision and delivered through a small separate opening such as one makes for a colostomy, the first incision being completely closed after the afferent and efferent loops have been stitched together on the mesial and lateral aspects. The two loops are clamped across at the level of the skin, and the parts containing the growth and glands removed with a cautery. The result is that the two loops come to the surface like the barrels of a shot-gun, and in a few days the septum is destroyed by crushing, and finally the lumen of the gut restored by suture. The chief virtue of this operation is its amazing safety. I became intimate with the technique from Lord Moynihan when I was his private assistant. He informs me he has never had a death from this operation, and I have only had one in something over 30 cases—the fatal case was one in which a loop of small intestine had also to be removed owing to extension of the growth. This operation has not acquired the popularity it deserves and chiefly, I believe, because it has been asserted that the glands cannot be effectively dealt with owing to interference with the vascular supply of the parts which are left. I believe this is quite wrong, as on one occasion I deliberately tied the superior hæmorroidal vessels and no appreciable sloughing ensued in the lower loop.

Correspondence.

"Audi alteram partem."

THE INITIAL LESION OF SLEEPING SICKNESS.

To the Editor of THE LANCET.

SIR,—With regard to your annotation in THE LANCET of May 25th, on the initial lesion of sleeping sickness, will you permit me to record that the illustrious Manson had pointed out, before 1910, the occurrence of this very lesion in some of his European cases of African trypanosomiasis? Sir Patrick concluded, and taught, that the indurated inflammatory lesion (carefully and almost unavoidably noted by the patient), which developed at the exact site of, and surrounding, the tsetse bite, and sometimes persisted for many weeks, signified an *infective* bite, and that its recognition was very important in that thereby the sufferer could, and should, be brought quickly under treatment before the development of constitutional symptoms and severer lesions. In fact, early in 1910, when I had the happy privilege of being his house physician at the old and distinctive London School of Tropical Medicine founded by him at the Seamen's Hospital, Royal Albert Dock, he demonstrated to his class just such an initial (infective bite) lesion—an indurated inflamed circular node, on the leg of a case of Rhodesian trypanosomiasis in a white man. The patient, a professional hunter, had often been bitten by tsetses, but was quite positive that that particular bite on the shin had been the only one to develop into an inflammatory lesion and to be followed by fever.

In spite of Manson's teaching, reference to this initial lesion is absent from text-books on tropical diseases. To Dr. Graf therefore belongs the credit of its renewed and independent discovery, of demonstrating trypanosomes in the blood from the lesion, and of recognising and acting on its clear call for immediate antitrypanosome treatment.

I am, Sir, yours faithfully,

H. M. HANSCHELL.

Weymouth-street, W., May 25th, 1929.

To the Editor of THE LANCET.

SIR,—Your annotation would suggest that Dr. Graf was the first to observe what might be regarded as the infective bite and the particular reaction of the tissues to the same in cases of trypanosomiasis. This is not so. Sir Patrick Manson had noted and taught, certainly earlier than the year 1910, that patients the subject of trypanosomiasis frequently described one particular bite occurring a short time before they became ill and which had caused a very marked degree of induration and prolonged pain. He believed this to be the infective bite, and I well remember seeing with him one or two cases of the disease in which a clear-cut history of such a particular bite was elicited.

During the war, whilst I was in East Africa, I came across two cases of the disease in white soldiers, who gave a graphic account of a particular bite they had good cause to remember and which shortly preceded the onset of symptoms. These cases are described in an article I wrote on Trypanosomiasis in the East African campaign, and published in the *Journal* of the Royal Army Medical Corps in 1919.

Undoubtedly to Manson must be ascribed priority in describing what would appear to be the infective bite.

I am, Sir, yours faithfully,

H. B. NEWHAM, M.D., M.R.C.P., D.P.H.,

London School of Hygiene and Tropical Medicine,
Torrington-square, W.C., May 27th, 1929.

LEPROUS LESIONS OF THE SCALP.

To the Editor of THE LANCET.

SIR,—Dr. A. R. Davison's article on this subject in your issue of April 6th (p.717) is of extreme interest. Since I have seen this condition fairly frequently in Japan, I shall be glad if you will publish the following additional notes. Leprosy of the scalp, while not uncommon in India, seems to be comparatively common in Japan. In fact, Dr. Mitsuda, of the Government Hospital outside Tokio, claims that it is one of the commonest lesions found in leprosy. It seems to occur in two forms.

(*a*) A patchy alopecia, quite unlike that of syphilis, and is associated with and generally follows certain of the larger nerves of the scalp, e.g. the great occipital, superficial, temporal. Prior to complete alopecia in these areas one finds a thinning of the hair and then baldness. Not infrequently this is associated with anæsthesia of the scalp. The micobacterium of leprosy can be demonstrated in properly stained sections.

(*b*) The second type of lesion seen is complete alopecia of the whole head, associated with actual nodule formation. These occur chiefly over the front of the vertex.

During tours in the Far East of practically all the countries where leprosy is prevalent, it is only in Japan that I have seen leprosy affecting the head. Recently, however, I came across two cases in the Leper Farm at Nicosia, Cyprus. The disease in Japan is of a very severe type, and this is probably the reason why leprosy affects the head. Nowhere in the world have I seen such extensive nodular cases, and I am not surprised that the scalp should be affected. All the predisposing factors that Dr. Davison mentioned, except the short frizzly hair, occur in India as well as Africa. Therefore I feel that it is the type of disease rather than the individual which is the causative factor in determining whether this area of the body is invaded or not.

I trust Dr. Davison's article will stimulate others to look carefully for scalp lesions in leprosy.

I am, Sir, yours faithfully,

ROBERT G. COCHRANE, M.D.,
M.R.C.P., D.T.M. & H.

British Empire Leprosy Relief Association,
Cavendish-square, W., May 27th, 1929.

THE NEW IMPORTANCE OF RADIUM.

To the Editor of THE LANCET.

SIR,—In regard to the therapeutic use of radium for cancer and other conditions, and the treatment of disease by irradiation generally, there would appear to be two great dangers to real progress at the present time. First, a danger of uncontrolled enthusiasm, to be followed by the disappointment to which Mr. Victor Bonney referred in the recent discussion published in your issue of May 25th. Secondly, a risk that the opportunity is not taken by the medical profession at the present time to promote the most effective organisation for taking fullest advantage of the wide and sympathetic interest of the public in this important branch of medical work. There are, doubtless, many medical readers who are less concerned with the relative merits of operation versus radium in the treatment of any particular local condition, cancerous or otherwise, than with the fundamental proved fact that radium possesses real value in the treatment of cancer and possibly other conditions; that largely owing to shortage of supplies the study of this subject has been relatively neglected in this country; and that, in addition to shortage of supplies, there is a shortage in the number of the necessary trained investigators, whose services are essential for placing our knowledge of the subject on a true level.

It is probably true to say that radium and treatment by radiation has found one of its chief spheres of influence in gynæcological surgery, in the treatment of cancer of the cervix and uterine fibroids. In the allied field of obstetrics there is much hope for the future, in the results claimed by numerous German authorities, as to the prophylactic and curative values of irradiated milk in the treatment of rickets. If rickets can be controlled, the bearing of this on obstetric work and on child welfare and infantile health and mortality is profound and far-reaching. For some months past I have been investigating this subject with the coöperation of Dr. T. Y. Finlay, of the Child Welfare Department, Edinburgh, and Dr. J. B. King, of the Radiological Department of the Royal Infirmary, and the results of this inquiry, which will shortly be published, amply confirms the claims made by German authorities. The manner in which the use of irradiated milk controls the disorderly manner of growth of the cells characteristic of rickets is very striking, and opens up a vista of possibilities of far-reaching interest and importance.

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This would seem to be an instance of what I have already said, that it is extremely difficult to deprive any part of the colon of a viable blood-supply.

I am, Sir, yours faithfully,

Leeds, May 28th, 1929. E. R. FLINT.

THE LONDON RHEUMATISM CLINIC AND THE PROFESSION OF MASSAGE.

To the Editor of THE LANCET.

SIR,—It is a little hard that you should say, in a leading article on the London Rheumatism Clinic that there is "no proper clinic for out-patient treatment of those *in the early stages of disease* (the italics are mine) who can remain at home, and no place where those who have had the benefit of institutional treatment can receive the continued observation and after-care which will alone ensure results." After all, the Red Cross Clinic at Kensington has been doing this work for seven years, and only this last week we have been in frequent correspondence with the authorities at one of the spas about our various patients.

You give a list of four remedial agencies, every one of which, with the solitary exception of the water treatment, has been provided at Kensington, and in many hospital out-patient departments, for years past. Many other forms of treatment not mentioned are also provided. The only innovation that the new clinic can claim, so far as I can see, is the addition of the treatment with water in its various forms—a treatment which, though of undoubted value in some cases, is certainly by no means the most important part of treatment in the vast majority of other cases, particularly those which can best be described as of the early ambulatory type.

But setting aside this contention for the moment, I must confess that the last two sentences of the first paragraph are calculated to excite alarm. These read, "Those who are able and willing to pay a reasonable fee for treatment will do so and there is every prospect that the industrial assurance societies, all of whom have coöperated, will contribute. In this way the Clinic itself should be self-supporting or something like it." Does this mean that there is to be no almoner at the new Clinic, to safeguard the interests of the professional masseur and masseuse in private practice? There are 1550 masseurs and masseuses practising in the London district. Many of them have staked everything they possess on making themselves proficient, and in acquiring the necessary qualifications to enable them to practise all the various forms of physical treatment which are to be provided at the London Rheumatism Clinic, with the solitary exception of the water treatment. If patients who can afford to pay for private treatment are to be taken at this Clinic for any form of physical treatment other than one of the recognised forms of bath treatment, an immense amount of hardship will be done to the private masseur and masseuse.

At our Clinic at Kensington, not only have we fixed a minimum fee, but we have fixed a maximum fee as well; anyone who, in the opinion of our trained almoner, can afford to pay more than the maximum of 5*s*. per treatment is handed over to the care of a masseuse in private practice and in this way the interests of these highly skilled, hard-working and, for the most part, generous members of a recognised profession are safeguarded. I know it is perfectly simple to say that any patient suffering from rheumatic symptoms would be benefited by the addition of some sort of bath treatment to the electric, massage, manipulative, and exercise treatment which is prescribed, but in the great majority of ambulatory patients, radiant heat, massage and ionisation, or diathermy, faradism, and skilful manipulation and graduated exercise form the main-stay of treatment. If patients for whom this treatment will be adequate, and who can afford to pay the customary fees of private physical treatment practice, are to be treated at the new Clinic, the private practice of the masseur and masseuse in London will disappear. If it were in the best interests of the patients that this should be so, then naturally there is no more to be said. I submit, however, that it is not so.

For the insured populace, of course, the new Clinic will be a godsend. We have frequently tried to induce the various insurance societies to make use of the Clinic for their members, and have not infrequently been successful in obtaining grants on their behalf. Undoubtedly there are a number of people whom regular bath-treatment would help more than other forms of physical treatment, but they form a comparatively small minority and the best possible treatment can usually be given without this adjunct in early ambulatory cases.

I am, Sir, yours faithfully,

JAMES MENNELL.

Park-crescent, Portland-place, W., May 20th, 1929.

CICATRISATION OF WOUNDS.

To the Editor of THE LANCET.

SIR,—In an annotation entitled the Cicatrisation of Wounds in your issue of May 11th (p. 989) it is stated that the optimum hydrogen-ion concentration of the tissue juice lies between 7·4 and 7·8. Sympathectomy, it is said, suppresses the acidity of wounds, and brings the pH back to the most favourable point. I would be glad to know if this is the generally accepted view. I had thought that the normal pH is round about 7·3–7·4, and should regard 7·8 as well over to the alkaline side with predominance of sympathetic. Removal of sympathetic action would, in my view, reduce the alkalinity of blood and increase the acidity, allowing of the acid vagus predominance. This fits in with recent writers who find that ammonium chloride increases the healing of wounds and with my own use of calcium chloride.

I am, Sir, yours faithfully,

Darlington, May 18th, 1929. R. CHALMERS.

VACCINATION INSERTIONS.

To the Editor of THE LANCET.

SIR,—The recent Commission on Vaccination recommended that not more than two insertions of lymph be made; but I understand that public vaccinators have received no fresh instructions, and are continuing to make four. In the case of re-vaccinations by a practitioner who is not a public vaccinator, can two insertions be relied on to give adequate protection?

I am, Sir, yours faithfully,

May 25th, 1929. H. S. S.

THE FINANCE OF VILLAGE SETTLEMENTS

To the Editor of THE LANCET.

SIR,—In a review of Dr. W. Bolton Tomson's book "Some Methods for the Prevention of Tuberculosis," reference is made (THE LANCET, May 18th, p. 1039) to his "defence" of tuberculosis village settlements, and to his courage in dealing with "the weak spots in village settlements—their finances." I would suggest that the word "support" would be better than "defence," for so far as I know village settlements have never been attacked with success. In face of their achievements, indeed, it would be impossible to do so. As to their "weak spots," our only weak financial spot is that we at Papworth have to house cases that come from all over England. Papworth has spent over £10,000 in housing London cases alone; and the London boroughs, who have thus been relieved of the cost of maintaining the families of these cases, have not contributed a penny towards this. This is a very weak spot, but it is no argument against village settlements. At a nett trading cost of less than

£3000 Papworth Industries have paid £112,000 in wages to normally unemployable persons suffering from clinical tuberculosis in a moderately advanced form. If this is not sufficient demonstration that finance, at any rate, is not the "weak spot" of village settlements, I can only say that there are none so blind as those who won't see. Village settlements cost money, of course, like railways and battleships; but as they save more than they cost, and limit the spread of infection into the bargain, they surely need no "defence" on the "weak spot" of finance.

I am, Sir, yours faithfully,
P. C. VARRIER-JONES,
Medical Director, Papworth Village Settlement.
Papworth Hall, Cambridge, May 27th, 1929.

⁂ Dr. Tomson is convinced that no better agent has been devised in this or any other country for combating tuberculosis than the village settlement, and we commended this claim with its financial implications to the serious consideration of our readers. A whole-hearted support of the settlement principle need not blind its advocates to the financial side of this as of all other antituberculosis measures.—ED. L.

Public Health Services.

SMALL-POX MILD AND SEVERE.

A Memorandum issued by the Ministry of Health last week is directed towards the misunderstanding here and in America as to the prevalence of small-pox in this country. It is pointed out that small-pox of mild degree has been more than usually prevalent in *England and Wales since 1922, the number of cases* having reached the peak of 14,787 in 1927, while the maximum number of 53 deaths occurred in 1928, being a percentage mortality of 0·43. These cases of small-pox of mild degree have been distributed chiefly in certain industrial areas where vaccination among adolescents and adults has been relatively neglected. The increased movement of the people, together with *the extreme mildness of degree of infection, has tended* to disseminate the malady. This mild small-pox, however, is now regarded as showing signs of abatement, and in England, at all events, we are no worse off than we have been for a quinquennium. Dealing with the *Tuscania* outbreak, it is stated that the number of severe cases which arose from this source amounted to 51 (out of 1554 passengers and crew); of these, 35 occurred in England and 16 in Scotland, 10 cases proving fatal. There has been no further infection from the *Tuscania* since April, and the outbreak, which was in any case narrowly restricted, has definitely terminated.

ADMINISTRATIVE ACTION AGAINST AN INSURED PERSON.

THERE is a well-founded grievance among insurance practitioners that the rules for the administration of medical benefit, printed on the medical cards of insured persons, are not loyally observed, while a strict watch is kept on infringement of any regulations for medical conduct. One of the rules on an insured person's card prohibits him from making unreasonable demands upon the professional services of the practitioner who attends him, and another lays it down in so many words that except in serious emergency the insured person shall not summon the practitioner to visit him after 9 at night or before 9 in the morning. A case has recently been dealt with by the Birmingham Insurance Committee in which a doctor lodged a complaint against an insured person on his list for a flagrant breach of this rule. It was stated without contradiction that, being summoned at midnight to attend a woman at her father's house, he found there a drunken brawl in progress, and the alleged patient suffering from no injury or illness. The Insurance Committee found the complaint as well based, and imposed a fine of half-a-crown, which, if inadequate in the particular case, may serve as a reminder to the great mass of inconsiderate insured persons, should it be feasible to bring the decision pointedly to their notice.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

Reading.

THE estimated population of this county borough in 1928 was 96,183, the Registrar-General's figure not being available. Other statistics were: birth-rate, 15·5; death-rate (crude) 11·9, (standardised) 10·4; tuberculosis, 1·13; cancer, 1·33; respiratory diseases and influenza, 1·5; *and heart disease, 1·9. The rates per 1000 births were:* neonatal 28, infant 53·6, 1 to 5–year children 23, and maternal from childbirth 6·7.

Dr. H. J. Milligan mentioned in his last report that two cases of small-pox had occurred at Battle Infirmary in the early weeks of 1928; there were no further cases during the year. A notable feature of 1928 among the infectious diseases was the increased prevalence of diphtheria, including many cases of a severely toxic character. The notifications of diphtheria numbered 136 and the deaths 19, giving a case mortality-rate of 14 per cent. All of the fatal cases showed acute toxæmia. Tracheotomy was performed on five patients at the Park Hospital, of whom all but one recovered. The disease was widely distributed and schools did not appear to play an important part in its spread. There is no evidence in Reading of a decline in tuberculosis. The deaths from the pulmonary form have remained practically constant in the years since the war. In 1928 there was a considerable increase of non-pulmonary tuberculosis deaths. The proportion of tuberculous milk remains high. During 1928 44 samples were examined and five gave a positive result, equivalent to 12 per cent. The corresponding figures for the three preceding years were 7 per cent., 17 per cent., and 14 per cent. respectively.

The maternity and child welfare scheme has been extended in the following respects: consultants have been appointed for puerperal fever, complicated cases of labour, and ophthalmia neonatorum; an agreement has been made with the Royal Berkshire Hospital for the hospital treatment of complications of pregnancy and labour, and with the Queen Victoria Nursing Institute for the home nursing of such cases; and an agreement has been made for the admission of mothers and babies to Battle Infirmary in cases of severe ophthalmia neonatorum. The Dellwood Maternity Home had a successful year, and more than one-sixth of the confinements in the borough were conducted there.

The refuse of the borough is tipped at Manor Farm. The usual tip nuisances have arisen and measures are being taken to mitigate them by lowering the height of the tip and by covering it more efficiently with earth. There are 24 slaughter-houses in the borough, of which 14 are owned by the Corporation, and eight registered and two licensed are owned privately. The public slaughter houses are of old design and inconvenient and new premises are needed. There is still an urgent shortage of working-class houses. A review of the insanitary houses in the borough was made during the year, and indicates that there are 107 houses, mostly more than 100 years old, which cannot be made reasonably fit for human habitation. There is a second category of 391 houses without a separate water-supply or a separate water-closet, and many of these are also suitable only for demolition. The housing committee has resolved to allot a certain number of newly constructed flats to suitable tenants now occupying insanitary houses.

In his school report Dr. Milligan expresses his regret that nothing is being done during the pre-school age to prevent the occurrence of such defects as enlarged tonsils and adenoids, defective vision and carious teeth, and he urges the great importance of the teaching of hygiene and of habits of health and cleanliness at the earliest possible age. The answers to a questionaire addressed to the head teachers show that the teaching of practical hygiene is not by any means general. The report of the school dentist, Miss Marion S. Mackinnon, shows that the dental staff is quite insufficient to cope with the work. A new method of treating unhealthy nasal passages was begun in 1928, and consists in massaging the nasal passages with soft inflatable rubber bougies, the size of which is gradually increased. For this treatment the word "diastolisation" (a Greek equivalent for dilatation) has been quite unnecessarily coined. It is claimed that the treatment will restore the normal function of the nose. Sixty-eight cases were selected, 36 of nasal catarrh or obstruction, 18 of otorrhœa, and 14 of deafness. Sufficient time has not elapsed to enable any verdict to be given as to results.

Ilfracombe.

The population of this urban district is estimated at 9067 and reaches a maximum during the season of 35,000. The birth-rate for 1928 was 11·5 and the crude death-rate 12·3 (standardised 9·2). As regards other rates the figures on which they are based are small. Thus five infant deaths gave an infant mortality of 48 and one maternal death a child-birth rate of 9·6. The cancer and heart disease rates were high, 2·2 and 2·5 respectively, and the respiratory with influenza rate low—viz.: 1·2—as one would expect in a health resort. The tuberculosis rate was 0·99. The hours of bright sunshine were 1531·3 and the rainfall about 40 inches.

Dr. D. C. Adam reports that the water-supply is of the highest purity. It comes from moorland gathering grounds in the Forest of Exmoor. As it has a plumbo-solvent action at certain periods of the year the use of lead pipes in its distribution for domestic use is forbidden. There is a great shortage of houses suitable for the working classes and the closing of unfit houses cannot be enforced. No subsidy houses were erected during the year. There are 44 cowkeepers, but there is no producer of graded milk in the district. One dealer, however, has a licence, issued last June, to bottle and sell Grade A (T.T.) milk. There is one public slaughter-house situated conveniently away from the centre of the town. It requires to be extended in order that the three private slaughter-houses, situated undesirably near the centre of this health resort, may be closed.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 18TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 362 (last week 277); scarlet fever, 1978; diphtheria, 944; enteric fever, 40; pneumonia, 1475; puerperal fever, 57; puerperal pyrexia, 121; cerebro-spinal fever, 17; acute poliomyelitis, 1; acute polio-encephalitis, 1; encephalitis lethargica, 26; dysentery, 10; ophthalmia neonatorum, 96. No case of cholera, plague, or typhus fever was notified during the week.

The largest incidence of small-pox at the moment is in London (Bethnal Green 13 cases, Stepney 26), Chesterfield R.D. 11, West Ham 45, Ashton-under-Lyne 28, Stoke-on-Trent 41, Spenborough (Yorks) 22, and Ebbw Vale 13 cases.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on May 21st–22nd was as follows:—Small-pox, 332 under treatment, 12 under observation (last week 292 and 15 respectively); scarlet fever, 1447; diphtheria, 1582; enteric fever, 13; measles, 136; whooping-cough, 830; puerperal fever, 26 (plus 13 babies); encephalitis lethargica, 111; poliomyelitis, 1; "other diseases," 61. At St. Margaret's Hospital there were 14 babies (plus six mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was 1 death from small-pox, 1 (0) from enteric fever, 81 (1) from measles, 5 (1) from scarlet fever, 63 (20) from whooping-cough, 23 (3) from diphtheria, 33 (9) from diarrhœa and enteritis under two years, and 81 (14) from influenza. The figures in parentheses are those for London itself.

The death provisionally classified to small-pox was assigned to London (Woolwich Met. B.). Two cases in which small-pox was mentioned as the cause of death should (it is stated) have been reported in earlier returns. One of these has been provisionally assigned to Lincoln C.B. (week ended April 13th), and the other to Stoke-on-Trent C.B. (week ended April 20th). No great town reported more than three deaths from influenza except Manchester with 5, Bournemouth, Stoke-on-Trent, and Birmingham with 4 each. Liverpool reported 17 deaths from measles, Leeds 7, Birmingham and West Hartlepool 6 each. The mortality from whooping-cough continues to diminish; Manchester still has 4 deaths to report, Liverpool 3. No more than 2 deaths from diarrhœa occurred in any great town.

The number of stillbirths reported during the week was 301 (corresponding to a rate of 41 per 1000 births), including 51 in London.

Obituary.

HUGH LATHROP MURRAY, F.R.C.P. & S. EDIN.

Dr. Hugh Murray, who died at Melbourne on March 17th in his sixtieth year, had made his mark on the practice of medicine in the Commonwealth, for it was under his tutelage that the very fine department of physiotherapy at Melbourne Hospital attained its full development. He himself narrowly escaped being a martyr to his pioneer work, for he was suffering from exposure dermatitis before he gave up the personal direction of the X ray department.

The son of a commissioner of the Victorian Railway, Hugh Murray was born at Ararat, Victoria, in 1869, and was educated at Melbourne before entering on his medical curriculum at Edinburgh, where he qualified in 1892. In the following year he served as house physician to Dr. Andrew Smart at the Royal Infirmary, and continued to study for the higher qualifications of both Royal Colleges. Returning to Australia in 1895, he settled in a residential suburb of Melbourne, where he became a successful general practitioner long before his attention to physical agents brought him recognition in that special department of medicine. He lectured to and examined the Australian Massage Association, of which he was actually the founder, and it was his undaunted persistence which saw the Massage Registration Act through the Victorian Parliament, whereby an end was put to the unlicensed practice of medical electricians, physical culturists, and the like. In 1916 he served as regimental medical officer with several Australian battalions in Egypt, and in the following year he organised the department of medical electricity at No. 3 Australian Auxiliary Hospital in England. On his return to Melbourne he was put in charge of the physiotherapy department of No. 11 General Hospital, where he carried on his army work until 1921, with special attention to the muscle re-education required by many of the sufferers from war injuries.

The colleague to whom we owe many of these biographical details writes of Hugh Murray as a man of splendid physique, with the activity and grace of the all-round athlete. Already in his early student days he had won swimming and throwing championships, and had played lacrosse for Victoria against South Australia. At the age of 21 he beat the world's record for throwing the lacrosse ball, only to be beaten by his brother, the present holder, a few years later. He had a baritone voice of wide range, finely modulated and excellently controlled, which brought him in request in his Edinburgh days at public concerts and social functions. Unfortunately, his later years were clouded by illness, for he suffered from renal calculus, undergoing two operations for its relief, and developed angina pectoris; but in these troubles he maintained the fortitude and cheerfulness which were characteristic of him from his student days.

Dr. Murray was twice married. His first wife was the daughter of John Macinnes of Melbourne, and by this marriage he had two sons, of whom the elder qualified last year at University College, London, and the younger, an officer in the Royal Air Force, recently flew in a Moth aeroplane from Peshawar to Queensland. His second wife, who survives him, is the daughter of James Calvert of Kyabram, Victoria.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At a congregation on May 24th the following degrees were conferred:—

M.D.—V. B. Wigglesworth and L. B. Winter.
M.B. & B.Chir.—J. R. H. Towers and H. W. Nicholson.

UNIVERSITY OF OXFORD.—Convocation has passed a decree thanking Mr. Gilbert Varley for the offer to transfer to the University the sum of £6000, subject to a life annuity, to be at the disposal of the University for the furtherance of medical research in accordance with the wishes of his brother, the late Richard Stanley Varley.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.—Dr. R. Dods Brown will deliver the Morison lectures at the College at 5 P.M. on Monday, Wednesday, and Friday, June 3rd, 5th, and 7th, his title being Some Observations on the Treatment of Mental Diseases.

ST. THOMAS'S HOSPITAL MEDICAL SCHOOL.—The *Duke of Connaught will distribute prizes in the Governor's* Hall of St. Thomas's Hospital at 3 P.M. on Tuesday, June 11th.

SOUTH LONDON HOSPITAL FOR WOMEN.—Princess Helena Victoria will open a garden party at this hospital on Clapham Common at 2.45 P.M. on Saturday, June 1st.

THE ROSS ARCHIVES.—The British Museum trustees have decided that the papers relating to Sir Ronald Ross's discovery that the anopheles mosquito is the vector of malaria, which were presented to the Museum last year by Lady Houston, shall be transferred to the Ross Institute at Putney.

LEBANON HOSPITAL FOR MENTAL DISEASES.—The thirtieth annual meeting of this hospital took place on May 21st at Friends House, London. Dr Fortescue Fox, who presided, said that a recent visit to Syria with the secretary had impressed him more than ever with the importance and magnitude of the task of caring for the insane in that country. The first hospitals to undertake the humane and curative treatment of mental disease in the Near East were founded a little more than 30 years ago: in Egypt, by Dr. Warnock; in Jerusalem, by a group of Jewish women, and at Asfuriyeh, in Syria. Whereas the number of beds for mental diseases per population in England and Wales was 1 in 270, in Egypt it was 1 in 4500, in Palestine 1 in 6000, and in Syria 1 in 16,300. Great extensions were in contemplation in Egypt under the guidance of Dr. Dudgeon, and in Palestine, in both cases under Government auspices. The need for additional beds in Syria was even more urgent. The Lebanon Hospital was entirely voluntary, and was a small but well-equipped unit (150 beds). It had remained open to all nationalities and religions, through famine and revolution, and enjoyed the entire confidence of the country and of the French authorities. As Sir George Newman had stated on a recent visit, it was seriously overcrowded. Happily the hospital had become to a great extent a self-supporting institution, but it still looked to the Central Committee in London and affiliated committees for all capital expenses for buildings and improvements, and for salaries and pensions. Dr. Fox *hoped that new helpers would come forward* to make an investment for these sufferers which would bring in sure dividends of health and happiness in that country.—Dr. E. W. G. Masterman (chairman of the London Committee) said that two new houses were needed (one for men and one for women), and mentioned the possibility of help from New Zealand in erecting a New Zealand memorial house with 50 beds.—*Dr. Doris Odlum referred to the large* number of indigent cases (110 in 1928) that were now sent by the local authorities in Syria, and to the large number of cures obtained.—Sir Wyndham Deedes said that of all the work done in that part of the world there was nothing that better commended the West to the East, both in its nature and in the manner in which it was done. After further speeches a letter was read from Dr. John Warnock, late of Cairo, warmly advocating the extension of the work.

The office of the hospital is at 139, Marylebone-road, London, N.W. 1.

EXTENSION OF INVERNESS NORTHERN INFIRMARY.—The Duke of York, who is Earl of Inverness, has opened a new children's ward, which the Duchess, who accompanied him, named "the Princess Elizabeth of York Ward."

CUMBERLAND INFIRMARY.—The governors have received £500 from Mrs. Glyn, of Dalston, for the endowment of a cot in the infirmary in memory of her husband and four sons. An anonymous donor has given £1000 towards the Radium Fund.

MEMORIAL TO A PHYSICIAN.—A window in memory of the late Dr. Landel R. Oswald, physician superintendent at the Glasgow Royal Mental Hospital at Gartnavel, was unveiled last week in the church of the institution. The window is the gift of his brother.

SOUTHEND GENERAL HOSPITAL.—The plans for *the new General Hospital at Southend-on-Sea* have been enlarged, and it is now proposed to provide 196 instead of 168 beds, at a cost of £136,000. There will be 26 beds for paying patients, a similar number for maternity cases, and eight for eye cases. Eventually the hospital will be extended to hold from 400 to 600 beds.

NEW TREASURER OF THE KING'S FUND.—The Prince of Wales, as President of King Edward's Hospital Fund for London, has appointed Mr. Edward Robert Peacock as chairman of the Finance Committee and treasurer of the Fund. Mr. Peacock, who succeeds the late Lord Revelstoke is a director of Baring Brothers and Co., and has been a director of the Bank of England.

HOPE UNION INFIRMARY.—Sanction has been given by the Ministry of Health to an extensive enlargement of the Hope Union Infirmary of the Salford Guardians at Pendleton. It is claimed that with the new portion the institution will be one of the largest separate hospital units in the world. There will be 1500 beds, and a further 500 for aged and infirm persons in adjoining buildings.

HOSPITAL COÖPERATION AT LIVERPOOL.—The Merseyside Hospitals Council have made an arrangement with the guardians of the West Derby Union whereby the guardians have agreed to treat any cases admitted to their *poor-law hospitals which, in the opinion of their medical* officer, would normally be admissible to a voluntary hospital. Payment will be made out of the Penny-in-the-Pound Fund without cost to the contributor.

A LIVERPOOL MOTOR AMBULANCE.—From the proceeds of their "Panto Day," the Liverpool University undergraduates have voted *£1500 to provide the Merseyside* Hospitals Council with a motor ambulance for the use of the out-patients' departments. It will accommodate ten sitting cases, will be warmed by hot water, and will be fitted with an arrangement for keeping lying-down patients, in a horizontal position when the ambulance is descending an incline.

ST. BARTHOLOMEW'S HOSPITAL, ROCHESTER.—This hospital, which was founded in 1078 by Bishop Gundulph and claims to be the oldest institution of its kind, is crippled for lack of space and money, and the Mayor of Rochester is appealing for help. Although there are only 126 beds last year there were 1858 in-patients. The Mayor, Coun*cillor F. C. A. Matthews, announces* his intention of "sitting outside the Guildhall" from 8 in the morning till 8 in the evening to-day (Saturday) to receive contributions.

THE LANCET: SUBSCRIPTION RATES.

INLAND	One Year	£2	2	0
	Six Months	1	1	0
	Three Months	0	10	6
ABROAD	One Year	2	10	0
	Six Months	1	5	0
	Three Months	0	12	6

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For complete scale of advertisement charges apply to THE MANAGER.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Friday, June 7th.—10 A.M. LARYNGOLOGY: Summer Meeting. Papers by Mr. F. J. Cleminson, Mr. Musgrave Woodman, and Mr. W. S. Thacker Neville on Treatment of Carcinoma of the Œsophagus. Mr. Harold Barwell and Dr. J. A. Gibb: Inflammation in the Maxillary Antrum and Frontal Sinus. Also papers by Mr. W. S. Thacker Neville and Mr. O. Popper. 5 P.M.—Paper: Dr. W. Jobson Horne: Cancer of the Vocal Cords. Clinical Cases will be shown by Mr. Norman Patterson, Sir James Dundas-Grant, and Dr. A. L. MacLeod.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.

Tuesday, June 4th.—5 P.M., Dr. H. H. Dale: Some Chemical Factors in the Control of the Circulation (First Croonian Lecture).

Thursday.—5 P.M., Dr. H. H. Dale: (Second Croonian Lecture).

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

Monday, June 3rd.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Ward Visit. 2 P.M., Mr. Bishop Harman: Eye Department.

Tuesday.—10 A.M., Medical Registrar: Ward Visit. 2 P.M., Mr. Addison: Operations. 2 P.M., Mr. Sinclair: Surgical Out-patients.

Wednesday.—10 A.M., Dr. Owen: Children's Out-patient Department. 2 P.M., Mr. Tyrrell Gray: Operations. 2 P.M., Dr. Scott Pinchin: Medical Out-patients.

Thursday.—10 A.M., Dr. Grainger Stewart: Neurological Department. 11.30 A.M., Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. MacDonald: Genito-Urinary Out-patient Department.

Friday.—10 A.M., Dr. Pritchard: Medical Ward Visit. 12 noon, Dr. Shaw: Clinical Demonstration. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.

Saturday.—9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Children's Medical Out-patient Department. 10 A.M., Resident Assistant Surgeon: Ward Visit. Medical and Surgical Out-patients at 2 P.M., daily. Operations. Special Departments daily, 10 A.M. to 5 P.M., Saturdays 10 A.M. to 1 P.M. Special Classes in Anæsthetics and Operative Surgery.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

Monday, June 3rd.—2.30 to 5 P.M., Medical Surgical, and Gynæcological Clinics. Operations.

Tuesday.—2.30 to 5 P.M., Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

Wednesday.—2.30 to 5 P.M., Medical, Skin, and Eye Clinics. Operations.

Thursday.—11.30 A.M., Dental Clinics. 2.30 to 5 P.M., Medical, Surgical, Nose, Throat and Ear Clinics. Operations.

Friday.—10.30 A.M., Throat, Nose and Ear Clinics. 2.30 to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

Monday, June 3rd, to Saturday, June 8th.—MEDICAL SOCIETY, Lecture Room, 11, Chandos-street, Cavendish-square, W., M.R.C.P. Course. Lectures on Tues. and Frids. at 8.30 P.M. Tues., Prof. Hugh MacLean: Nephritis with Special Reference to Cardiovascular Involvement. Frid., Prof. Hugh MacLean: Recent Views on Diabetes and Insulin. HOSPITAL FOR DISEASES OF THE SKIN, Blackfriars-road, S.E. Clinical demonstrations by Dr. Willmott Evans, at 3.30 P.M., on Thurs. (No fee for attendance.) ROYAL NORTHERN HOSPITAL, Holloway-road, N. Clinical demonstration (fractures) by Mr. F. D. Saner, at 10.30 A.M., on Sat. (No fee for attendance.) ROYAL WESTMINSTER OPHTHALMIC HOSPITAL, Broad-street, Holborn, W.C. Special afternoon course continuing for three weeks.—THE INFANTS HOSPITAL, Vincent-square, S.W. Second week of afternoon course.—Further particulars from the Fellowship of Medicine.

ST. THOMAS'S HOSPITAL, Albert Embankment, Westminster Bridge, S.E.

Thursday, June 6th.—5 P.M., Prof. S. J. Cowell: Dietetics. (Last of six lectures.)

UNIVERSITY COLLEGE, Gower-street, London.

Thursday, June 6th.—5 P.M., Mr. R. J. Lythgoe: Special Sense Physiology. (Last of six lectures.)

NATIONAL HOSPITAL, Queen-square, Bloomsbury, W.C.

Monday, June 3rd.—2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Mr. Leslie Paton: Papillœdema (2).

Tuesday.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Mr. Donald Armour: Cranio-cerebral Topography.

Thursday.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Gordon Holmes: Lesions involving the Optic Chiasma (2).

Friday.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Symonds: Neurosyphilis (3).

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmorland-street, W.

Thursday, June 6th.—5 P.M., Dr. R. O. Moon: Some Observations on Diseases of the Myocardium. (St. Cyres Lecture.)

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

Friday, June 7th.—3.30 P.M., Mr. Ferguson: Changes in the Eye in General Diseases.

Appointments.

Durie, Doris L., L.R.C.P. Lond., M.R.C.S., D.P.H., has been appointed Assistant Medical Officer of Health, Southend.

Horne, H. F., M.D., B.Chir. Camb., Medical Referee under the Workmen's Compensation Act for Barnsley County Court.

Quastel, J. H., D.Sc., Ph.D., Bio-Chemist, Cardiff City Mental Hospital.

Schofield, J. E., M.B., Ch.B. Sheff., F.R.C.S. Eng., Deputy Medical Superintendent, Hackney Hospital.

Vacancies.

For further information refer to the advertisement columns.

Accrington, Victoria Hospital.—H.S. £150.
Albert Dock Hospital, Connaught-road, E.—Res. M.O. at rate of £110.
Barking Urban District Council.—Asst. M.O. and Asst. School M.O. £500.
Birkenhead County Borough.—Res. Asst. M.O. £150.
Birkenhead General Hospital.—Hon. Dermatologist.
Birmingham, City Hospital for Infectious Diseases, Little Bromwich.—4th Asst. M.O. £300.
Birmingham, Selly Oak Hospital.—Cas. O. At rate of £200.
Birmingham and Midland Homœopathic Hospital and Dispensary. H.S. £150.
Cambridge, Addenbrooke's Hospital.—Res. Anæsthetist. Also H.P. At rate of £180 and £130 respectively.
Carshalton, Surrey, Queen Mary's Hospital for Children.—Jun. Asst. M.O. £500.
Carshalton U.D.C. Maternity and Child Welfare Services.—M.O. of Clinics. Rochester Road Clinic, £100 per annum. Stanley Road Clinic, 30s. for each attendance.
Chelsea Hospital for Women, Arthur-street, S.W.—Jun. H.S. At rate of £100.
Chester Royal Infirmary.—H.S. £120.
Chesterfield and North Derbyshire Royal Hospital.—Cas. O. and H.S. to Ear, Nose and Throat Dept. At rate of £200.
City of London Hospital for Diseases of the Heart, &c., Victoria Park, E.—H.P. At rate of £100. Also Laryngologist.
City of London Maternity Hospital, City-road, E.C.—Registrar. £100.
Derby, Derbyshire Hospital for Children.—H.S. £150.
Dover, Royal Victoria Hospital.—H.S. £180.
Dreadnought Hospital, Greenwich, S.E.—H.P. and H.S. Each at rate of £110.
East Ham Memorial Hospital, Shrewsbury-road, E.—Res. M.O. Also Res. H.P. and Cas. O. At rate of £150 and £100 respectively.
East London Hospital for Women, &c., Shadwell, E.—Pathologist. £400.
Essex Administrative County.—Asst. M.O.H. £600.
Evelina Hospital for Children, Southwark, S.E.—H.P. At rate of £120.
Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—Res. Surg. O. At rate of £175.
Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—H.S. Also H.P. Each at rate of £100.
Hertford County Hospital.—H.P. At rate of £150. Also Hon. Surg.
Hong-Kong.—Asst. Clinical Pathologist. £720.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S. and H.P. Each at rate of £100. Also Res. M.O. for Country Branch, Tadworth, Surrey. At rate of £250. Also Surg. Reg. £300.
Hove, Lady Chichester Hospital.—H.P. At rate of £100.
Hull Royal Infirmary.—Cas. H.S. At rate of £130.
Ilford Emergency Hospital.—Hon. P.'s also Hon. S's.
Ipswich, East Suffolk and Ipswich Hospital.—Cas. O. £150. Also 2 H.S.'s. Each at rate of £120.
Kensington, Fulham and Chelsea General Hospital, 194, Finborough-road, Earl's Court, S.W.—Res. Cas. M.O. At rate of £100.
King Edward Memorial Hospital, Mattock-lane, Ealing, W.—Consulting Ophth. S.
Lancashire County Council.—Asst. County M.O. £800.

Lancs. County Council, High Carley Sanatorium, Ulverston.—Asst. Tuber. M.O. £450.
Lancaster, Royal Albert Institution for the Feeble-minded.—Jun. Asst. M.O. 8 gns. a week.
Liverpool, Bootle Borough Hospital, Derby-road.—Anæsthetist. £50.
L.C.C. Mental Hospital Service.—8th Asst. M.O. £300.
London Jewish Hospital, Stepney Green, E.—Cas. O. At rate of £150.
Lowestoft and North Suffolk Hospital.—H.S. £120.
Male Lock Hospital, 91, Dean-street, W.—H.S. At rate of £200.
Manchester, Ancoats Hospital.—Assist. Pathologist. £150.
Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Sen. Res M.O. At rate of £125.
Manchester, Salford Royal Hospital.—H.P. Also Three H.S.'s to special departments. Each at rate of £125.
M.A.B., Infectious Hospitals Service.—Jun. Asst. M.O.'s. Each £300.
M.A.B. Mental Hospitals Service.—Jun. Asst. M.O. £500.
M.A.B., Sutton, Surrey, Antitoxin Establishment, Belmont Laboratories.—Bacteriologist. £700.
Miller General Hospital, Greenwich Road, S.E.—Out-Patient Officer. At rate of £150.
Montrose Royal Asylum.—Jun. Asst. M.O. £325.
Northampton Mental Hospital, Berrywood.—Locum Tenens M.O. 7 gns. a week.
Northamptonshire County Council.—Tuberculosis Officer. £750.
Nottingham, Harlow Wood Orthopædic Hospital, near Mansfield.—Res. Surg. O. ; £250.
Norwich, Norfolk and Norwich Hospital.—H.S. £120.
Plymouth, South Devon and East Cornwall Hospital.—Res. Surg. O. At rate of £150. Also H.S. At rate of £100.
Portsmouth Royal Hospital.—H.P. At rate of £130.
Portsmouth, St. Mary's Hospital, Institution, &c.—3rd Asst. Res. M.O. £250.
Preston, Biddulph Grange Orthopædic Hospital.—Jun. H.S. At rate of £150.
Princess Louise Kensington Hospital for Children, N. Kensington.—Hon. Assist. Surgeon to Ear, Nose and Throat Dept.
Queen Mary's Hospital for the East End, Stratford, E.—Res. M.O. £200. H.P. and Cas. O. £150. Also H.P., Two H.S.'s and Obstet. H.S. Each £120.
Queen's Hospital for Children, Hackney-road, E.—H.P. £100.
Rochdale Infirmary and Dispensary. Jun. H.S. £175.
Romford, Oldchurch Hospital.—3rd Asst. Res. M.O. £250.
Royal London Ophthalmic Hospital, City-road, E.C.—Surgeon to Ear, Nose and Throat Dept.
Royal Northern Hospital, Holloway, N.—H.S. Also Res. Med. Cas. O. and Anæsthetist. Each at rate of £70.
Ryde, Royal Isle of Wight County Hospital. Res. H.S. £130.
St. Peter's Hospital for Stone, Henrietta-street, Covent Garden, W.C. Clin. Assts.
Salop County Council.—Asst. M.O. £600.
Sheffield Royal Hospital.—Residents. At rate of £80.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S. £150. H.S. for Ophthalmic and Aural Departments. £150. Also Asst. H.P. £125.
Sudan Government Medical Dept.—Two M.O.'s, LE720.
Sudan Medical Service.—M.O. LE720.
Sydney University.—Chair of Physiology. £1100.
Taunton and Somerset Hospital.—Sen. and Jun. House M.O.'s. At rate of £150 and £100 respectively.
Torquay, Torbay Hospital.—Hon. Surgeon.
University of London.—External Examinerships.
Warrington Infirmary and Dispensary.—H.P. At rate of £150.
Watford Peace Memorial Hospital.—Locum Tenens H.S.
West London Hospital, Hammersmith-road, W.—H.P., H.S., Aural S., and Ophth. H.S. Each at rate of £100.
York County Hospital.—H.P. and H.S. Each £150.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Brampton (Cumberland); Lesmahagow (Lanark); Newport (I. of W.); and at Muirkirk (Ayr).

Births, Marriages, and Deaths.

BIRTHS.

RODGER.—On May 25th, at West Lodge, Bicton Heath, Shrewsbury, the wife of Dr. Kenneth M. Rodger, of a son.

MARRIAGES.

ARTHUR—ROBSON.—On May 25th, at Chelsea, Arthur Samuel Arthur, Lieut.-Colonel, R.A.M.C., to Mrs. Ellen Seymour Robson.

BAILEY—MEADE.—On May 15th, at Epsom Parish Church, Basil Noel Victor Bailey, M.B., Ch.B. Edin., D.T.M. and H. Eng., of Georgetown, British Guiana, to Ena Elizabeth Meade, of Woodbury, Reigate-road, Ewell.

CAMAC WILKINSON—FRY.—On May 23rd, at St. Marylebone Church, London, W. Camac Wilkinson, M.D., F.R.C.P., to Dulcie Dea, daughter of Mr. and Mrs. Walter R. Fry, of Sydney.

DEATHS.

GIMSON.—On May 21st, at Springfield House, Chelmsford, William Douglas Gimson, M.R.C.S., L.R.C.P., aged 61.

HUXTABLE.—On May 25th, Richard Rossiter Huxtable, L.R.C.P., M.R.C.S., late of Sutton Ely.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

PROTOPLASMIC BUBBLES.

ARCELLA is a testaceous protozoan about 0·1 mm. in diameter. The shell is shaped like a bun and on the lower flat side is a large hole through which the pseudopodia are extruded when the animal is active. It has been known for a long time that the various species of the genus had the remarkable capacity of producing bubbles of gas in the protoplasm and of afterwards absorbing them. The meaning and mechanism of this procedure is obviously of great interest, and the last number of the *Quarterly Journal of Microscopical Science* is entirely occupied with a beautifully illustrated account of the researches into the subject which occupied the late Dr. E. J. Bles, of Cambridge, for many years chequered with serious ill-health and ending with his death in 1926. Shortage of oxygen stimulates the production of the gas vacuoles with the useful result that the animal is floated to the surface of the water where oxygen may be had. But bubbles are also formed if Arcella is rolled over on to its back. Engelmann (using another species) studied this reaction and thought that the animal was ingenious enough to adjust the size and position of the bubbles so that it got it right side up. Dr. Bles, working with *A. discoides*, could not confirm this in all details; the actual righting of the animal is, according to his observations, achieved by a pseudopodium reaching over and getting a grip of something firm; the bubbles merely reduce the specific gravity and make the reversal much easier. When the animal has regained its natural position the gas is quickly absorbed and the vacuoles disappear. The gas produced to form the bubbles is oxygen and apparently pure or nearly pure oxygen. Among the various proofs of this are some elegant experiments with methylene blue. An Arcella in a dilute solution of this dye remains unstained. If it is then taken out into clean water (and even kept till next day) and then rolled on to its back the cytoplasm in spots near the periphery turns blue and bubbles appear in blue areas which fade away as the bubbles are afterwards reabsorbed. Evidently the dye is absorbed by the animals, but reduced to the leuco compound; it does not become manifest until oxygen is produced in response to some external stimulus. A large part of the paper is occupied with an intricate argument about the mechanism by which free oxygen is generated. The sum of it is that it arises from an oxidase system, working presumably on hydrogen peroxide as an intermediate metabolite. It is here that some commentary by Sir Gowland Hopkins and Dr. D. Keilin (who have edited the paper for publication) would have been useful; recent years have seen great advances in our knowledge of oxidases of which Dr. Bles was hardly aware. But the whole forms an unusually interesting chapter of cellular physiology which has a far wider significance than the motions of Arcella.

MUSEUM TECHNIQUE.

Dr. Maude Abbott is to be congratulated on the latest of the occasional publications[1] of the Association of Medical Museums of which she has always been the moving spirit. The contents are as varied as the daily work of a morbid anatomist and museum curator, and all are of interest. There are a number of obituaries of deceased members of the Association, including a curious portrait (p. 265) which we should hardly have suspected to be Adami; another on the frontispiece is easily recognisable. Another notable feature is a full account by Prof. P. Masson, lately migrated from Strasbourg to Montreal, of his methods of cutting sections and fixing them to slides with gelatin and of his various staining methods which, for all their æsthetic drawbacks, are becoming well-established in pathological laboratories. Articles on celloidin corrosion, mounting calculi, silver staining, and a number of other practical topics are all useful. The journal also deals with results as well as methods; teratology occupies a considerable section of which, as one might expect, malformed hearts have the greater share. Several pages give queries from puzzled members, some of which are answered, and there is an exchange department for pathological material. We should be glad to know if this really works usefully in practice. The whole is lively reading for any working pathologist. Our only criticism is that the book is sewn so tightly that it will not lie open.

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[1] Journal of Technical Methods and Bulletin of the International Association of Medical Museums. March, 1929. Pp. xxviii. + 321. Dr. Maude E. Abbott, McGill University, Montreal.

TRAFFIC ACCIDENTS IN DENMARK.

In a paper by Dr. T. G. Knudtzon, of the Medico-Legal Institute of the University of Copenhagen, published in *Nordisk Medisinsk Tidsskrift* for May 4th, with the title the Doctor's Medico-Legal Duties in Cases of Traffic Accidents, a table is published which shows at a glance how enormous is the increase in the burden thrown by modern vehicular traffic on the medico-legal expert. The figures in column II. refer to the number of official post-mortem examinations on persons dying as a result of traffic accidents in Copenhagen and the Danish islands. Those in column III. refer to the total number of official post-mortem examinations made in the same period and area. The figures in column IV. indicate the number of motor vehicles in Denmark from time to time, whilst those in column V. show the total population of Denmark in certain years in the period under review.

Year.	II.	III.	IV.	V.
1910 ..	0	3	—	—
1911 ..	6	17	—	2,757,000
1912 ..	2	19	6,094	—
1913 ..	2	25	—	—
1914 ..	1	33	8,678	—
1915 ..	5	41	—	—
1916 ..	4	68	—	2,921,000
1917 ..	1	62	15,923	—
1918 ..	1	58	—	—
1919 ..	4	58	—	—
1920 ..	12	90	29,819	—
1921 ..	5	93	—	3,267,000
1922 ..	4	82	—	—
1923 ..	19	105	—	—
1924 ..	25	161	65,123	—
1925 ..	23	146	—	3,419,000
1926 ..	25	161	—	—
1927 ..	54	203	96,906	—
1928 ..	89	275	107,971	3,497,000

NEW PREPARATIONS.

Acécoline (Laboratories Chevretin-Lematte, Rue La Bruyère, Paris).—In THE LANCET of March 9th (p. 493) we published an article on the Therapeutic Application of Acetylcholine by Prof. Maurice Villaret, physician to the Hôtel-Dieu, Paris, and Dr. L. Justin-Besançon, Director of the Laboratory of the Faculty of Medicine of Paris, in which the authors summarise their research into the properties of this new vaso-dilating preparation. In view of this article the Anglo-French Drug Co., Ltd., of 238A, Gray's Inn-road, London, W.C., point out that they hold a stock of acetylcholine-hydrochloride which they are marketing under the name of acécoline.

Johnson's Allsoy Biscuits.—From the Johnson's Cereal Food Company, 2, Bridge-road, Willesden, N.W.10, we have received a sample of Allsoy biscuits, which are made of soya flour, nut butter, and saccharine, the analysis supplied with the sample showing moisture 2·70 per cent., starch 0·70 per cent., fat 39·45 per cent., protein 32·81 per cent., nitrogen-free extract 18·93 per cent., fibre 1·55 per cent., mineral salts 3·86 per cent.—from which it will be seen that the biscuits contain no sugar, while starch is less than 1 per cent. The biscuits are quite palatable, and have been found a suitable and digestible adjunct to diet in patients suffering from eczema and eruptive cutaneous disorders associated sometimes with high blood pressure. It is pointed out by the manufacturers that in severe cases of diabetes their use is less obvious and may be deleterious.

THE FUTURE OF MEDICAL PRACTICE.

To the Editor of THE LANCET.

SIR,—Many of those who read the letter by "Forward" in THE LANCET of April 27th will no doubt appreciate how it strikes a note to the effect that the future of medicine is merely one of the side issues of commerce. In a nation of shopkeepers it is well that the physician be merely a "dagone" salesman. When all the doctors will "hold a stated amount of stock," so that "they may have a financial interest and stake in the success of their hospitals," the next step will be somewhat to pursue the patient even after death in demanding a bonus from the undertaker, a notion which contains exactly 200 cents to the dollar. In concluding, "Forward" says, "Also we could control both the number and type of students entering the different medical schools, and gradually build up a profession of which the medical men and the nation generally could be justly proud." From which it seems there is no cause for present elation. And yet one cannot help reflecting that the English seats of learning have always sent forth just that type of cultured and highly skilled gentlemen who made the profession what used to be considered an honourable one. These universities have ever eschewed the donating of M.A.s of the soda fountain and Sc.D.s in hot air. As to the selection of students the present standard of written examination in Latin, Greek, mathematics, &c., has everything to commend it. Many, to the credit of all concerned, proceed to degrees in arts, science, modern languages, philosophy, and so on before taking up the study of medicine proper, and thus still further carry a real culture to all environments; a poor training certainly in the catch-as-catch-can of the industrial market. There are, however, reasons for everything, and it will be well to investigate the causes whereby such suggestions as those of "Forward" should discover themselves. If the situation is inevitable it were well either to burn our bridges or prepare for the worst.

I am, Sir, yours faithfully,

California, U.S.A., May 9th, 1929. EN AVANT.

GOGARBURN INSTITUTION.

THE details of the new institution for the feeble-minded at Gogarburn were given on p. 1114 of our last issue. The memorial stones were laid by the Duke and Duchess of York on May 22nd, when there was a large assemblage representing both the city of Edinburgh and the south-eastern counties. "The day was ideal," writes our Edinburgh correspondent. "The beauty of the old estate, varied by the new buildings, itself symbolised the beneficent purpose of the new colony. In the afternoon sun, the grey-brown of the old mansion house against the delicate summer green of the beech trees, all toned by the glimpse of the Pentlands to the south, made a very beautiful picture. For its new purpose, the site is as fitting as for its old. It is one more example of the adaptive developments of a democratic civilisation."

DONATIONS AND BEQUESTS.

Mr. W. Lewis Morris, of Wallasey and Liverpool, left about £30,000 to charities. Subject to a life interest, he gave £5000 to the Liverpool Hospital for Cancer and Skin Disease; £3000 to the Wallasey Victoria Central Hospital, Liscard; £2000 to the Wallasey Cottage Hospital, and the ultimate residue for charitable institutions or objects as the executors may think proper.—Sir Harry Branston, of Crewe Hill, Farndon, Cheshire, left the balance of £1000 war stock invested by him out of the moneys received as salary as an M.P. as to two-thirds to the Chester Royal Infirmary, and one-third to the Nantwich Cottage Hospital.—Mrs. Victoria Gildea Grimond, of Barbazon Lodge, Sunningdale, Berks, left £2000 to the Dundee Infirmary for the endowment of two beds.—Mr. Montague Goodall, of Hampstead, left £1000 to University College Hospital; £500 each to the Hampstead General Hospital and Dr. Barnardo's Homes; and £250 each to the Royal London Ophthalmic Hospital and the National Lifeboat Institution.—Mr. Charles Arthur Wells, of Epping, left £1000 each to the Queen's Hospital for Children, Hackney-road, the City of London Hospital for Diseases of the Heart, Victoria Park, and to the London Hospital.—Mr. John Braidwood Gray, of 16, Kensington Gore, London, left, besides other bequests, £2500 to King Edward VII. Hospital Fund for London, and £500 each to St. Mary's Hospital, St. George's Hospital, Victoria Hospital for Sick Children, London, and the Surgical Aid Society.—Mr. Hermann Edward Frederick Bonner, of Villa Gloirette, Monte Carlo, Monaco, left £5000 to the Hospital for Sick Children, Great Ormond-street, London, W., and £2000 to the German Hospital, Dalston.

THE COMPOSITION OF CELLULOSE.

A CORRESPONDENT, referring to our leader last week on the Lessons of the Cleveland Disaster, writes to point out that gelatin is not a constituent of celluloid as is there implied. We regret the phrasing of the statement, which should, of course, have read "a gelatinised product of" nitrocellulose and camphor.

Vasotomy in the Treatment of Early Urethritis.—Mr. J. F. Peart writes that the statement attributed to him (THE LANCET, May 25th, p. 1095) that he "had done vasotomy only twice" is misleading. It should have been clear from the heading and context that the allusion was to vasotomy *in early urethritis* which has never been advocated, nor so far as he can ascertain, practised before he did it in April, 1927.

Primogeniture.—Dr. M. T. Macklin asks us to state that the full text of her paper on Primogeniture as a Factor in the Production of Developmental Anomalies, an abridged version of which appeared in THE LANCET of May 11th (p. 971), will be published with the bibliography in an early number of *Human Biology*. The paper was read before the Royal Society of Canada in Winnipeg.

Croonian Lectures

ON

SOME CHEMICAL FACTORS IN THE CONTROL OF THE CIRCULATION.

Delivered before the Royal College of Physicians of London

BY H. H. DALE, M.D. CAMB., F.R.C.P. LOND., F.R.S.,
DIRECTOR OF THE NATIONAL INSTITUTE FOR MEDICAL RESEARCH.

LECTURE I.

(Delivered on June 4th.)

INTRODUCTION.—VASOMOTOR HORMONES.

SIX years ago I had the honour of giving here the Oliver-Sharpey lectures,[1] and chose as my subject the Activity of the Capillary Blood-vessels. My aim in those lectures was to bring together the evidence, much of it then of recent date, on the independent contractile activity of these minute vessels and its bearing on certain problems of physiology and pathology. Among the investigations which had provided this evidence were some in which I had myself taken part; and these had been largely concerned with the vascular effects of certain intensely active chemical principles. One of these, adrenaline, had long been known as a natural hormone, and as the first of the hormones to be chemically isolated, structurally identified, and prepared by artificial synthesis. Two other bases, rivalling adrenaline in the intensity and evanescence of their activity on the tone of the small blood-vessels, were also mentioned—histamine and acetyl-choline. There was then no evidence, however, which seemed to me adequate to justify the supposition that either of these substances was a normal constituent of the animal body. Their actions afforded a means of reproducing with certainty, and in graded intensity, changes in the tone of blood-vessels closely similar to those occurring in certain physiological and pathological responses. For the closer study and analysis of such responses, their use, and especially that of histamine, had been convenient and helpful. There was a certain amount of evidence suggesting that substances having what, for brevity, we called a "histamine-like" action might be liberated from injured or irritated tissues and play a part in the associated vascular reactions; but mere similarity of action on the blood-vessels did not afford evidence of identity or even of similarity in chemical structure. We were at that time concerned not so much with the chemistry of the agent, which we regarded as possibly inaccessible to investigation, as with the physiology of the reaction; and the results obtained by studying the effects of these known bases were applied only by way of analogy.

In the intervening six years evidence from a number of sources has produced a great change in the situation. In 1926 Sir Thomas Lewis gave his Croonian lectures on the Blood-vessels of the Human Skin, and in the following year published, in the remarkable book bearing the same title,[2] a systematic review of the investigations, mainly carried out by himself and his co-workers, on which the lectures had been based. A point of central interest in these researches was the recurrent evidence of liberation from injured or irritated cells of a chemical substance, closely resembling histamine in its action, and responsible for the vasodilatation and wheal-formation in the immediate neighbourhood of the lesion. In place of a plausible speculation we were thus presented with a fact, established by an impressive array of convergent and cumulative evidence. Meanwhile my own associates had been making progress, far beyond expectation, in the isolation in pure form from extracts of normal tissues, and the chemical identification, of substances producing the actions on peripheral blood-vessels with which we were concerned. From an entirely different direction evidence has appeared indicating that those changes in the automatic rhythm of the heart which are produced by stimulation of the vagus on the one hand, and of the sympathetic nerve-supply on the other, are not the results of the direct passage of nerve impulses to the heart muscle, but are mediated by the liberation, in close relation to its fibres, of chemical principles having inhibitory and excitatory actions. Again, a literature of recent growth and impressive volume has been devoted to the properties and significance of a substance which can be extracted from the heart, and particularly from the region of the sino-auricular node, and which has a stimulating effect on the rhythm. To this substance has been attributed the function of providing the natural stimulus to the heart's normal activity. From several different directions, therefore, evidence is accumulating of chemical factors in the control of the circulation, reinforcing and supplementing the long-recognised mechanisms of nervous control, and even intervening in the production of their effects. Moreover, between those chemical principles which appear to be concerned in the control of the function of the heart and those which are concerned with the variation of vascular tone, we have not merely a functional link, in that all are involved, in different ways, in regulating the circulation of the blood; in more than one instance there are grounds for suspecting that we may be dealing with the same chemical principle, exhibiting its activity in different forms on different organs. It has accordingly appeared to me that I might appropriately use this opportunity for a survey of the evidence concerning some of these chemical factors in the control of the circulation. I shall not attempt an inclusive review, but devote attention primarily to those factors concerned, in one direction or another, with the maintenance or modification of vascular tone. So far as evidence dealing with actions on the heart, or on other organs, is brought into the discussion, it will be on account of its bearing on my main theme. My choice of this limitation is determined partly by the direction of the investigations in which I have personally participated, and partly by the consideration that the evidence dealing with the agents concerned in vascular reactions is, as yet, more definite and detailed, especially on the chemical side, than any we have as to principles to which an exclusive effect on the heart's activity is attributed.

I shall of necessity touch on certain vascular phenomena with which I dealt, from another point of view, in the Oliver-Sharpey lectures, and on those which provided the rich evidential material of Sir Thomas Lewis's more recent Croonian lectures. My concern, however, will be primarily with the nature, distribution, and properties of the principles providing the chemical stimuli for such reactions; and the evidence which now makes it possible to speak with some assurance as to their chemical nature is largely a product of the past three years.

In order to give completeness to the conception which I wish to present to you, it will be desirable, in the first place, to pass in rapid survey over some familiar ground, and to consider the parts played in the control of the circulation by the long known substances which have claims to be regarded as circulatory hormones in the true sense—epinephrine or adrenaline, and the vasoconstrictor principle of the pituitary body. When I speak of these as "hormones in the true sense," it is necessary to make my meaning more explicit. When Bayliss and Starling introduced the word "hormone," they intended it to apply to an active principle formed in one organ and carried by the blood to others, in which it produces its specific stimulating or pharmacodynamic effect. Their discovery of secretin had suggested the need for a short term to indicate such chemical carriers of physiological stimuli by way of the blood stream. It appears to me to be very desirable, in the interests of clear thinking, to restrict the use of such a word to the meaning originally applied to it. In that original sense adrenaline might be taken as the perfect type of the hormones; and the pituitary vasoconstrictor principle, which, in view of its recent physiological separation, we may now refer to as "vasopressin," has at least a presumptive claim to be included in the list. In the larger part of these lectures, however, I shall be dealing with substances of a similarly intense physiological activity, restricted in its normal incidence to the immediate neighbourhood of their liberation. The distinction between the function of such a locally acting chemical stimulant and that of a true hormone, carried everywhere by the circulation, seems to me to be a real one, and one having a special significance for our present purpose.

ADRENALINE AND VASOPRESSIN.

Adrenaline and vasopressin have the characteristic of true hormones, that each is formed locally in an organ having the specific function of its production, and is distributed by the blood to all parts of the body, affecting all blood-vessels which are specifically sensitive to its stimulus. In neither case have we any evidence that the blood-vessels of the producing gland are sensitive to the hormone formed in immediate relation to them. On the contrary, we may regard it as practically certain that they are not so; in the presence of relatively high concentrations of a vasoconstrictor so potent as either of these, the small vessels of the gland, if showing the sensitiveness of those in other organs, would be constricted to obliteration; the circulation through the endocrine tissue, essential to the hormone function, would be rendered impossible. The fact that both these general circulatory hormones are predominantly vasoconstrictor in their action, is worthy of note by itself. Apart from these general similarities the two differ widely, in what we know of their chemical nature, of their detailed modes of action, and of the conditions under which they are secreted into the blood and exhibit their actions on distant organs.

Adrenaline (Epinephrine).

It is probable that our knowledge of adrenaline, of the conditions governing its secretion into the blood, and of the details of the method of its action, is more complete than of any other hormone. A relatively simple basic derivative of catechol, it was successfully produced by synthesis many years ago. It is readily destroyed by oxidation at the reaction of the body fluids, and quickly disappears from blood circulating through organs which react to its stimulus, so that its action, when applied through the circulation, is a very evanescent one, unless it is injected in quantities altogether above the physiological range. Accordingly it is admirably fitted for the temporary reinforcement, in response to some sudden emergency, of the effects of true sympathetic nerves on almost all organs supplied by them. The fidelity with which it reproduces such true sympathetic effects, augmenting or inhibiting the functions of different contractile or secreting cells in close accordance with their response to sympathetic impulses, was made clear many years ago, particularly by the work of Elliott.[3] It is further known, as hitherto in the case of no other hormone, that the output of adrenaline from the suprarenal medulla is under nervous control, responding to impulses in the splanchnic nerve-fibres running to the gland. The gush of adrenaline into the venous blood accompanying a sudden emotion, and the adaptation of its effects, especially on the circulation, to the physiological needs of the emergency, have been emphasised by Cannon.[4]

As regards the circulatory mechanism, we must suppose that adrenaline is carried in almost equal concentration to all parts of it, reproducing the sympathetic accelerator and augmentor effects on the heart-beat, and affecting the blood-vessels in the sense of their response to sympathetic impulses. The variations of this response, in intensity and even in direction, produce large variations in the relations between the vascular tone in different systems. The vessels of the gastro-intestinal canal are apparently in all animals more sensitive to the vasoconstrictor effect than those of the skeletal muscles, so that a small dose of adrenaline entering the general circulation will tend to produce a redistribution of the blood-supply, in favour of the muscles and at the expense of the alimentary canal. In some species—the cat and the dog—minute intravenous doses of adrenaline, given under the ordinary conditions of experimental anæsthesia, cause a relaxation of the minute vessels, particularly of the skeletal muscles, which often so predominates over the slight vasoconstriction produced by such doses in other tissues, as to give, on balance, a definite fall of arterial pressure. The meaning of this depressor, vasodilator action of small doses of adrenaline has been the subject of a number of investigations in quite recent years. Macdonald and Schlapp [5] have pointed out the pronounced accentuation of the phenomenon by administration of ether. In the decerebrate preparation the balance of the effect may change from depressor to pressor action, according as ether is given or withdrawn; and it has been suggested that the vasodilator action may not occur in the normal animal, but only under the artificial conditions imposed by ether. On the other hand, Richards and I were able to detect it on several occasions in the action of extremely minute doses of adrenaline on the vessels of the surviving, artificially perfused hind limb of the cat. On the whole, it seems to me probable that this dilator effect of minute doses of adrenaline, particularly on the small vessels of the skeletal muscles, is a truly physiological effect, occurring in the normal animal, and that ether assists its predominance, in the general effect on the arterial blood pressure, by a relative depression of the vasoconstrictor effects in other tissues.

The question as to whether this action is due to a true, sympathomimetic effect of adrenaline itself, or to the secondary liberation of a directly dilator principle, has also been raised. Richards and I [6] some years ago indicated the many points of resemblance between this special, weak vasodilator effect of adrenaline, as seen in the cat's limb, and the much more powerful dilator effect of histamine. The same changes of conditions, affecting the tone and response of the vessels, seemed always to accentuate or depress the two effects together. We were led to locate the action of both on the same type of minute vessels; and the resemblance was so suggestive as later to raise the question whether this effect of adrenaline might be due to a reactive liberation of histamine, just as a small dose of histamine, injected into a normal cat certainly causes the suprarenal gland to respond by a small gush of adrenaline (Kellaway and Cowell).[7] Burn and I [8] thought we had detected such a mechanism in the lung, but later experiments with Richards [9] revealed an error in our technique. On the evidence yet before us we must regard this vasodilator effect, as seen typically in the cat and the dog, as probably a true effect of adrenaline itself. Whatever the mechanism of its production, I think we must regard it as an important factor, in those species in which it occurs, in the redistribution of the blood-supply, in favour of the skeletal muscles and at the expense of the digestive viscera, which is occasioned by a natural acceleration of the output of adrenaline from the suprarenal medulla. We may think of it, therefore, as an item in the more general series of changes emphasised by Cannon, replacing the physiological conditions favourable to contemplative digestion by those which fit the animal for combat or flight, when adrenaline gushes into the vena cava at the call of anger or fear.

Another effect of adrenaline, almost certainly concerned in such a redistribution of the blood-supply in accordance with functional need, recently came to light in some experiments, as yet unpublished, which I carried out last year with Dr. Walter Bauer and Dr. Dickinson Richards, American guests in my laboratory. It concerns the control of the blood flow through the liver of the dog, and depends on a mechanism which has not yet been found in other species. The branches of the efferent, hepatic veins in the dog are furnished with stout coats of plain muscle (Simonds).[10] This muscle, as Mautner and Pick [11] first showed, is very sensitive to the effect of histamine, which throws it into powerful contraction, damming back the blood in the capillary spaces of the liver, and causing a pronounced congestion of the whole organ. It can hardly be doubted that, during the process of digestion, small quantities of histamine absorbed from the contents of the bowel, in which they are certainly produced, will keep up some degree of such resistance to the venous outflow from the liver, with a resulting collection of a relatively large fraction of the total blood, firstly in the liver itself, and probably to some extent also in all the viscera drained by the portal vein. In the isolated dog's liver, artificially perfused both from the portal vein and the hepatic artery, by the use of a double perfusion scheme, we found it very easy to demonstrate this action of the hepatic veins, narrowing like a veritable sluice-gate in response to traces of histamine. Under these experimental conditions, however, we were able to recognise an antagonistic effect produced by stimulating the sympathetic nerves to the liver or adding small doses of adrenaline to the perfusing blood. We could observe the well-known constrictor effects of such stimuli on the branches of the hepatic artery, and, in weaker degree, on those of the portal vein; but even more striking than either of these, when the liver had become congested by resistance to the venous outflow, was the opening of the hepatic sluice, so that the turgid liver emptied its blood rapidly into the reservoir receiving the blood from the vena cava. Again I think we can hardly miss the physiological significance of such a mechanism. At a sudden call for vigorous activity of the voluntary muscles, under the stimulus of sympathetic impulses assisted by a gush of their chemical understudy, adrenaline, the veins would open widely and release, for the needs of the whole organism, blood which, during digestion, had been filling the capacious capillary bed of the liver. Anatomical studies may reveal the presence of such a mechanism in other species; by physiological methods we regularly obtained evidence of its function in the dog's liver, but failed to detect it in that of the cat.

While effects of adrenaline on the tone of the larger arterial branches to the lungs and to the brain cannot be excluded, it seems safe to say that functionally important effects on the small vessels, such as adrenaline shows in other organs, are not produced by it in these. Here again its action, or lack thereof, is closely parallel to that of the sympathetic nerves. Finally, the clearest exception to the predominantly vasoconstrictor action of adrenaline is provided by its dilator effect, again corresponding to an exceptional dilator action of sympathetic nerves, on the arteries supplying the heart. The reality and functional significance of this effect has been established by the recent work of Anrep and his co-workers, which, by an ingenious application of refined physical methods to the exact and continuous record of the coronary blood flow, has clearly differentiated effects on vascular tone from those due to the contraction of the heart muscle.

Vasopressin.

The pituitary vasomotor principle presents in many respects a contrast to adrenaline. Though its existence was recognised by Oliver and Schafer[12] only a year after their discovery of the action of suprarenal extracts, our knowledge of its chemistry is still relatively meagre. An important step has recently been taken, however, towards its separation in a state of physiological purity. For some years past opinion had been sharply divided as to whether one or several active principles were responsible for the pressor, uterine stimulant and antidiuretic effects produced by extracts of the pituitary posterior lobe. My colleague Dr. Dudley and I had supported by evidence and argument the view that two at least, and probably more, were concerned; Prof. Abel of Baltimore and his co-workers had strongly defended the view that all the actions were due to one principle, which they believed that they had obtained in approximately pure condition. During the past year the matter has been settled, as it seems to me beyond further dispute, by Kamm, Aldrich, Grote, Rowe, and Bugbee,[13] who have made almost complete the separation which Dudley had partially effected, obtaining a powerfully vasoconstrictor fraction, which they term "vasopressin," with but slight action on the uterus, and another fraction which they term "oxytocin," powerfully stimulating the muscle of the uterus, but almost inactive on the blood-vessels. The action of the whole extract on the plain muscle of the uterus, and on the vascular tone are, therefore, certainly due to different principles. It is not yet possible to give an equally certain answer to the question whether the third therapeutically important action of the extract, the antidiuretic action, is due to yet another active substance, or represents a different aspect of the activity of the pressor principle. Specimens of vasopressin hitherto available have certainly shown antidiuretic activity; but it remains to be proved whether they possess it in the same relative potency, in comparison with the pressor action, as do complete extracts of the fresh gland. It would lead me too far from my present subject to discuss the evidence in detail, but there are indications that the two kinds of activity may vary independently in different commercial extracts, and that some samples of oxytocin, at least, may show antidiuretic without pressor activity. The available information leads me to expect that the antidiuretic action will prove to be due to another distinct principle.

However that may be, our immediate concern is with vasopressin and its function in regard to the circulation. Of its chemistry we know little. We can be certain that it is not a simple base like adrenaline or histamine. It is moderately stable when boiled in acid solution, but easily destroyed by alkali, resistant to peptic but destroyed rapidly by tryptic digestion. It is obviously either itself a relatively simple peptide, or closely associated with a body of that type and unable to exist in active form apart from it. The other pituitary principles have closely similar properties, but such evidence as we have suggests that vasopressin is rather more complex than oxytocin. Injected into the circulation it is not, like adrenaline, rapidly destroyed. Its action is, accordingly, long persistent, and even after its subsidence the vessels long remain relatively insensitive to further injections, suggesting that the principle is still present after its obvious effects have largely disappeared. When large doses have been injected, a substance having a similar pressor action, and very probably the unaltered vasopressin, can be recovered from the urine.

For its true hormone function, and the manner in which it comes into action, the evidence is again remarkably incomplete and indirect. The same is true of the other active principles found in this lobe of the pituitary body. It is difficult, indeed, to believe that a substance so potently active on artificial injection should be concentrated in a structure without other known function, with no provision for its carriage by the blood to the tissue in which its intense activity becomes effective. There appeared to be more direct evidence of the hormone function of the antidiuretic principle, in the artificial *diabetes insipidus* produced by removal or injury of the lobe, and the control of a pathological *diabetes insipidus* by injecting the extract. Even here, however, opinion is still divided between loss of the hormone and injury of the hypothalamic region of the brain, as the cause of the morbid diuresis. According to recent evidence, however, the evanescence of the diabetes following lobe removal, and its renewal on injuring the hypothalamus, may be due to the fact that the latter acquires, vicariously, the function of forming and storing the hormones normally found only in the pituitary posterior lobe.

In the case of vasopressin the evidence seems to be even less direct or convincing. Cushing and Goetsch[14] long ago put forward evidence in favour of its passage from the lobe into the cerebro-spinal fluid, and similar evidence has been given by Dixon and Marshall[15] with regard to oxytocin, the secretion of which they found to be influenced by the functional state of the ovary. It has never been clear, however, that the whole of the principle leaving the gland passes by this route; the gland and its posterior lobe are well supplied with blood-vessels, and it is difficult to suppose that the blood passing through a tissue so highly charged with these diffusible principles could fail to carry its share. In any case, to reach the sites of their known actions they must eventually enter the blood stream; but there is no evidence of any nervous or other influence, by which the rate of the direct or indirect entry of vasopressin into the circulation is caused to vary. On the other hand, the fact that the posterior lobe of a given species, such as the ox, contains a remarkably constant proportion of vasopressin, at all times of the year and apparently under all physiological conditions, suggests a steady flow into the circulation, rather than a fluctuating output adjusted to the call of physiological emergencies, such as the evidence indicates in the case of adrenaline.

So far as its action has yet been analysed, vasopressin appears to produce its effects on the circulation by increasing the tone of the minute vessels without any discrimination corresponding to their nerve-supply. Earlier experiments, made with the crude extracts, had shown a stimulant action on the tone of isolated segments of large arteries. The effects, however, appear to have been due to non-specific impurities, and it is stated that vasopressin, when free from these, is without such action. Several observers (Sacks,[16] Lawrence and Hewlett[17]) have observed the ghastly, corpse-like pallor of the skin, especially of the face, produced in a normal man by a moderate dose of the pituitary extract injected intravenously. The effect is associated with a relatively trivial rise of the general arterial pressure, and occasions little subjective sensation. It can only be attributed, as Lewis points out, to constriction of the minute skin vessels, which in some areas seem to have a peculiar sensitiveness to vasopressin.

The effects of such artificial injections of an extract of the pituitary posterior lobe, or of its vasopressin fraction, on the blood-vessels of the human patient or of the anæthetised or spinal mammal, are indeed sufficiently impressive. There still remain, however, the questions of the degree of our certainty that the active principle does steadily enter the blood stream by a normal, physiological process, and of the function which it exercises, or physiological need which it satisfies, under such natural conditions.

In my Oliver-Sharpey lectures I dealt with Krogh's evidence,[18] derived from observations on the blood-vessels of the frog, which led him to the conclusion that the pituitary vasoconstrictor has the function of maintaining the normal tone of the capillaries, and therewith the normal restricted permeability of their walls. He found a substance, apparently diffusible, in mammalian serum, having properties compatible with the supposition that it was the normally circulating pituitary hormone. On the other hand, removal of the pituitary body in the frog had been observed to be followed by general œdema. Further observations published since that date, and a consideration of the evidence from animals other than the frog, have not strengthened the force of Krogh's evidence. Drinker,[19] working with Krogh, could not confirm the suggestion that the pituitary principle could reproduce all the effects of serum in preventing œdema of the perfused limb. Again, I know of no evidence that a recognisable loss of capillary tone follows removal of the pituitary posterior lobe in the mammal; the results of such an operation, except on the diuretic function, appear from the records, indeed, to be remarkably small.

We are still left, therefore, with evidence only incomplete and indirect of the passage of vasopressin from the pituitary body into the blood stream by natural secretion, and of its functional significance when thus distributed through the vascular system. I think it must be frankly admitted that the strongest evidence in favour of its function as a true hormone is still its occurrence in such quantity, in a tissue in which no local function can be imagined for it, and which yields it so readily to simple extraction with water.

NORMAL FUNCTION OF THE VASOMOTOR HORMONES.

Assuming, as I think we must, that vasopressin is always being secreted, at however slow a rate, into the circulating blood, we are still without data which would enable us to appraise the importance of its presence for the maintenance of a normal vascular tone. The same is true, indeed, of the adrenaline which, in the absence of any special stimulus, trickles slowly from the suprarenal gland into the *vena cava*. Destruction of the medulla of both suprarenal glands is not only compatible with indefinite survival, but is also without any definite effect on the general vascular tone or the arterial blood pressure of the resting animal.

Such absence of obvious change in the efficiency of the normal circulation, when the supply of one or another of these hormones is cut off at the source, appears less surprising when we consider them as items in the multiple provision for the maintenance of the vascular tone. We have, in the first place, the vasomotor centres acting through the sympathetic nerves. At the call of emergency their action is reinforced by accelerated output of adrenaline. It may be that the function of the pituitary hormone is to provide yet another safeguard against circulatory collapse, by a general and undiscriminating maintenance of tone in the small blood-vessels when sympathetic impulses and adrenaline alike begin to fail, under the stress of a prolonged and excessive demand for their action. Such a conception of its function would at least render intelligible the otherwise curious discrepancy between the trivial effects, on the arterial pressure and the general circulation, which its injection produces in the normal individual, and the remarkable restorative action which it exhibits on vascular tone, and therewith on the efficiency of the circulation, in the victim of primary surgical shock or vasomotor collapse.

If we accept the suggestion that the normal, slow secretion of these hormones has little effect on the tone of the vessels, while this is upheld by an efficient vasomotor centre, it is natural to inquire whether their presence in the blood can be detected by an action on vessels in an area deprived of its vasomotor supply, in an animal otherwise normal. It is, indeed, the fact, that vessels of which the vasomotor nerves have been cut, after an initial loss of tone, rapidly acquire a new one, which must be due to some constituent of the blood, and which often becomes greater than that shown by the corresponding, normally innervated vessels. This "automatic" or chemically stimulated tone, as Richards and I pointed out, affects chiefly the minute vessels, and especially the capillaries, on which histamine produces its characteristic vasodilator effects. Finding that these vessels rapidly lost their tone, and their power of responding to histamine, under conditions of artificial perfusion, and that these normal properties could be restored by a trace of adrenaline, we were inclined to attribute the recovery of tone after denervation to the circulation of traces of this substance. One difficulty in the way of such a supposition was that the denervated limb vessels, in natural circulation, showed a conspicuous dilator response to a very small dose of adrenaline itself, artificially injected. In more recent experiments Burn and I[8] have found that a small quantity of pituitary extract will similarly restore tone to these minute vessels in the perfused organ. It may be that both hormones are concerned in the recovery of vascular tone after denervation; and this is a possibility which could be tested by observing whether such recovery occurred in an animal from which the pituitary posterior lobe and the suprarenal medulla had both been extirpated.

The antagonism between the vasoconstrictor effects of these hormones and the dilator effects of histamine may give another and more direct hint as to their functional importance. In my Oliver-Sharpey lectures I mentioned the then recent observations of Kellaway and Cowell, showing the prompt acceleration of adrenaline output in the normal cat when a small dose of histamine was injected intravenously, and the slight and evanescent effects which resulted from the balanced antagonism, as compared with the enormously enhanced and prolonged depressor effects of the same small dose of histamine in a cat deprived of the suprarenal medulla. As I shall show later, these observations gain greatly in direct significance from our new chemical evidence on the occurrence and distribution of histamine in the body. At this stage we may note that observations are lacking as to the effects, on the reaction of the animal to histamine, of *extirpating the pituitary posterior lobe*, either alone or in addition to the suprarenal medulla. But, while the evidence is far from complete, I think it is already sufficient to suggest a probability that a really important function of these hormones in relation to the normal circulation may be found in their power to check, and to restrict within physiological limits, the depressor effects of substances dilating the small vessels, when these escape into the general circulation.

CENTRAL NERVOUS CONTROL OF VASOMOTOR TONE.

We have dealt so far with substances which, being secreted into the general circulation, and affecting the whole vascular system simultaneously, have an action which, with certain local exceptions and qualifications, is to increase or to uphold the tone of the small vessels. In this respect their action broadly resembles, and probably supplements, the effects of the nerve-centres controlling the tone of the vessels through their nerve-supply. There is evidence, indeed, of variation of the vascular tone by reflexes through the nerve-centres, causing unequal distribution of the blood-supply in favour of a particular organ. In the well-known Loven reflex, central stimulation of a sensory nerve from a limb causes general reflex vasoconstriction, accompanied by dilatation of the vessels in that limb, so that the circulation through it is increased. Bradford [21] observed a similar reflex dilatation of the kidney vessels, leading to increased blood flow through that organ, on stimulating centrally a neighbouring sensory root. The late Sir William Bayliss made a series of investigations on the centres involved in these vascular reflexes, and came to the conclusion that, in addition to the well-known vasomotor centres in the bulb and the cord, the action of which can be stimulated or inhibited, with resulting general increase or decrease of the vascular tone which they control, there are other centres which, when called into activity by sensory stimuli, cause active vasodilatation. There is no doubt at all of the reflex activation, through vasodilator centres, of such specifically vasodilator parasympathetic nerves such as the *chorda tympani* and the *nervi erigentes*, causing relaxation of the arterioles in particular localised areas. Bayliss held that, in addition to these local effects, vasodilator centres could cause more general arterial relaxation by impulses passing antidromically down sensory fibres.

Looking at the function as a whole, however, of the nerve centres controlling vascular tone, it is almost a commonplace to say that, like that of the hormones which receive a general distribution through the blood, it is predominantly tonic and vasoconstrictor. And this control, whether by the nerve centres or the true hormones, may be regarded as adapted to the maintenance of the average vascular tone needed for an efficient circulation, to its adjustment in relation to the pressure created in the large arteries by the heart's activity, and to mass variations in the distribution of blood-supply as between one system and another, or as between one organ and the rest of the body.

LOCAL VASODILATOR MECHANISMS.

A large proportion of the vascular reactions of the body, however, are of quite a different type from these, and are fitted to effect a much finer adjustment of the blood-supply to more closely localised requirements. Into this class come all reactions, most accessible to observation in the skin and superficial mucous membranes, but occurring in almost all organs, in which a localised stimulus, irritation, or injury causes a local, vasodilator reaction. Sir Thomas Lewis devoted his Croonian lectures a few years ago to a detailed experimental analysis of these local vascular reactions in the human skin. He found that, whatever the nature of the provocative stimulus or injury—mechanical, thermal, electrical, chemical, or photochemical—the reaction presented a characteristic threefold complex. This consisted of the local red reaction due to dilatation of the minute vessels, a wheal succeeding and coincident with this, and a surrounding irregular "flare" due to dilatation of stronger arterioles. The two former were independent of nerve-supply, while the latter involved the integrity of the terminal axon-branchings of the sensory nerve-fibres, and was obviously due to a local axon reflex. The immediate stimulus, however, to the whole reaction was, according to Lewis, a chemical one. Some substance was liberated from the injured cells which directly dilated the minute vessels and rendered their walls abnormally permeable, and, by its irritation of sensory endings, acted also as the primary stimulus to the reflex flare. He had thus proved that, in these local vasodilator reactions, a chemical agent took part, not merely as a reinforcement or alternative to a nervous mechanism, but as the sole primary stimulus to the whole series of reactions. He had no evidence as to the chemical nature of this agent; but among known pure substances he found that one reproduced this complex with detailed fidelity when introduced in minute dosage into the epidermis. This was the base histamine, the dilator effect of which on minute vessels, together with its constrictor effect on larger vessels and on the plain muscle of certain organs, had been studied by Laidlaw, Richards, and myself. Sollmann and Pilcher[20] had also observed that this substance, introduced by a special technique into the superficial layers of the human epidermis, caused local redness and wheal formation in much higher dilutions than any of a large number of substances which they tested by the same method. Lewis, using it at every stage of his systematic investigation of the reaction of skin vessels, produced a highly impressive series of analogies between its action and that of the substance naturally liberated from injured cells.

The similarity of action, however, gave at that time no warrant for assuming identity, or even similarity, of chemical nature. In my next lecture I shall endeavour to make clear the nature of the more recent evidence, which seems to me to have changed that situation, so that we can now regard it as highly probable that the substance recognised by Lewis, as liberated from irritated or injured cells of the human skin, and as evoking the vasodilator complex in their neighbourhood, is either histamine itself or some loose combination owing its action to histamine.

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Ingleby Lectures
ON
SOME TYPES OF SEPTIC INFECTION IN THE NEWLY-BORN.

Delivered in the University of Birmingham on May 23rd and 30th, 1929,

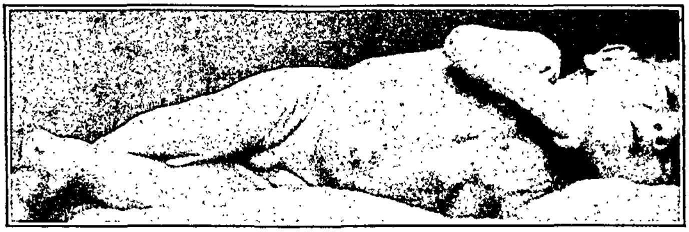
BY HECTOR CHARLES CAMERON, M.D., F.R.C.P. LOND.,
PHYSICIAN IN CHARGE OF THE DEPARTMENT FOR DISEASES OF CHILDREN, GUY'S HOSPITAL.

LECTURE II.*—TRISMUS NEONATORUM AS A MANIFESTATION OF SEPSIS NEONATORUM.

Its Confusion with Tetanus.

IN some cases of sepsis neonatorum it has been mentioned that after death there is disclosed the evidence of a widely spread cerebro-spinal irritation with œdema and hyperæmia of the pia mater, an exudation of serous or sero-sanguineous fluid and multiple small hæmorrhages. It has indeed been debated whether these post-mortem findings are the cause or the result of the striking clinical disorder known as trismus neonatorum. It has been said that they may be produced by the state of asphyxia and circulatory failure which precedes death, when the whole body is held in rigid spasm, and is liable to repeated and violent convulsive seizures. That they are the cause and not the results of trismus neonatorum seems to me proved by a careful consideration of all the circumstances. It has added to the difficulties that these cases have for long and persistently been confused with idiopathic tetanus. It may be that cases of idiopathic tetanus do occasionally occur in neonatal life. I know no way to disprove the possibility. But it is clear, I think, that trismus neonatorum is in general a manifestation, not of tetanus proper, but of sepsis, and that the assumption which has very usually been made that trismus neonatorum and tetanus are identical, has no justification whatever. It is perhaps of interest to notice that, if we exclude this neonatal disorder, tetanus is almost unknown, as Gowers[1] has emphasised, before the age of five.

FIG. 2.



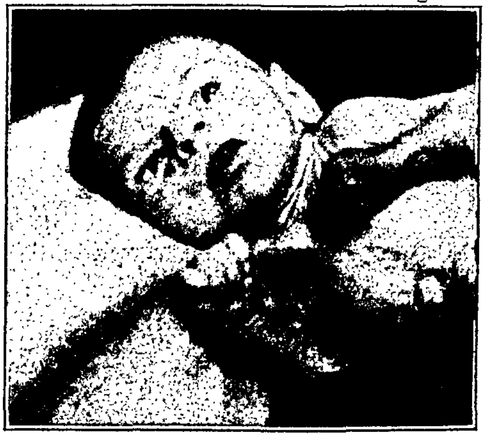
A case showing well the extreme rigidity of the whole body with a greater degree of trismus.

But even among adults we occasionally encounter this confusion clinically between tetanus and meningitis. Thus Batty Shaw,[2] in recording a case of streptococcal meningitis which during life was thought to be tetanus, writes as follows :—

> It is clear that meningitis may provoke spasm of the facial muscles, producing risus sardonicus, of the muscles of the neck and of the abdominal wall, that the spasm may be constant, lasting for hours or even for days, and that the spasm may be increased by irritation, such as is produced by nasal feeding, &c., the patient remaining conscious throughout the illness. Such features have been held in the past to constitute a clinical picture of undoubted tetanus. This view must be abandoned. It appears to us that no reliance can be placed upon an exclusive clinical picture of tetanus, because the disease may be accurately imitated by meningitis.

Batty Shaw further states that a search in text-books produced only one reference to the possibility of confusion (Allbutt and Rolleston[3]). I can, however, myself recall at least two cases of meningitis upon which I conducted post-mortem examinations on which a diagnosis of tetanus had been made during life. In the second case, as has happened in others, it was suggested that the meningitis had followed the injection of antitetanic serum insufficiently sterilised. The other case had had no serum. The possibility of confusion was certainly well known to the older physicians and, as I should have expected, is referred to in two separate places by Fagge and Pye-Smith[4] in their text-book. At a still earlier date the records of post-mortem examinations carried out upon cases which were regarded and described as tetanus include many in which the evidence of meningitis is described. A century ago, inflammatory appearances of the brain and spinal cord were confidently described as characteristic of tetanus, but tetanus, at that date, meant no more than muscular spasm.

FIG. 1.



A comparatively mild case, showing spasmodic contraction of the hands, rigidity of the facial musculature, and a mild degree of trismus.

In almost all cases of sepsis neonatorum there will be found some evidence of excessive rigidity of the muscles. The face is apt to be stiff and lined, with a haunted, startled expression well shown in Fig. 1. The arms are flexed at the elbows. The hands are held pronated, clenched, and with the thumbs adducted, a characteristic position quite unlike that of the "accoucheur's hand" of tetany.

In that variety of sepsis neonatorum which we are now considering this rigidity of the muscles is the most characteristic feature and is developed to a remarkable extent. It is combined with restlessness or partial coma, convulsions, twitching of the muscles, some degree of opisthotonos, and finally with trismus. The rigidity of the jaw, unlike what is found in true tetanus, is not an early development, nor is there any tendency for the jaw muscles to be involved with special severity. The rigidity of the jaw is in keeping with the rigidity of all the muscles. As I have been at some pains to emphasise the infant functions solely as a suction apparatus and, characteristically, it is this peculiarity of the infant that has focused the attention of observers upon this particular group of muscles and led to the confusion with tetanus. In cases which recover the spasm of the jaw in trismus disappears comparatively early, while the spasm in the hands and feet may remain for many weeks longer, a feature very unlike what we find in tetanus.

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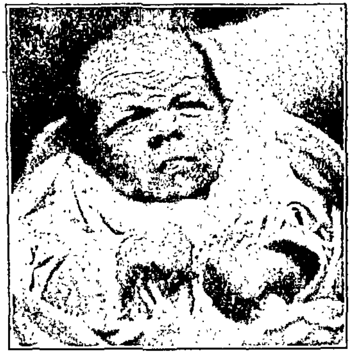
* Lecture I. appeared last week.

FIG. 3.



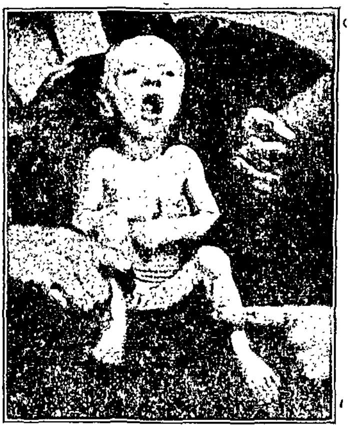
A severe case, showing complete "risus sardonicus" and spasm of the hands.

The accompanying photographs illustrate cases of trismus neonatorum which from time to time have been under my care. All were admitted to hospital in the first ten days of life. Two had septic exfoliative dermatitis of a mild sort, one had a septic umbilicus, one had a large sloughing ulcer on the palate (Bednar's aphtha), in a fifth no focus of infection was obvious, but the mother was admitted to hospital with puerperal symptoms. Fig. 1 shows a mild case which recovered in about three weeks. The face was stiff and lined, and there was generalised rigidity of all the muscles, and a slight degree of opisthotonos. The infant was unable to suck, and a finger introduced into the mouth was held firmly by the clenched jaws. Another case (Fig. 2) illustrates well the extreme rigidity of the whole body. Fig. 3 shows the condition in a third child, in which the severity was much greater, so that the simulation of tetanus was complete. Here we have the final picture of risus sardonicus. Death took place from gastro-intestinal disturbance a fortnight later, at a time when the spasm had to a great extent disappeared. Post-mortem examination showed great hyperæmia and congestion of the brain and spinal cord, with œdema of the pia mater. The study of the cerebro-spinal fluid in this case, removed during life, at the height of the spasm, showed clear evidence of cerebro-spinal infection or irritation. The cells numbered 250 per c.mm., and the protein content was raised to 0·12 per cent.—six times *the normal. Fig. 4, a photograph taken when the* infant was 3 weeks old, shows a case of special importance for my present argument. For many weeks the jaw was rigidly fixed, but with the mouth held widely open and not closed, a position recalling that characteristic of the progressive lenticular degeneration of Wilson.[5] The spasm of the hands and feet lasted for months. Indeed, it gave rise to a persistent deformity of the fingers, shown in Fig. 5. As we watched, there gradually developed a peculiar shortening of the tissues on the flexor aspects of the clenched fingers, so that ultimately, after all spasm had ceased, there remained an inability to extend the fingers because of this shortening. So far as I could judge, this infant, with a septic umbilicus, showed a condition identical with that of trismus neonatorum, save for the position of the jaw. The child, except for the persistent deformity of the fingers, made a good recovery, regaining the power to suck after about 16 days, but died when 2 years old from broncho-pneumonia.

The Disease of St. Kilda.—I believe that in these and other infants from poor homes in the south of London, I am witnessing the degenerate descendant of the awful *trismus nascentium, or eight days' sickness,* which was formerly so rife in this and all countries, which survived until recently in the remote Hebridean island of St. Kilda, which persists to-day among the negroes of the West Indies and the Southern States of America, and which appears to retain all its virulence and all its frequency among the natives of India, attracting only an occasional official comment in a Government statistical survey.

Formerly in this country new-born infants died in great numbers from a disease, characterised especially by trismus, which was called sometimes, from the day of its usual appearance, the "eighth day sickness" or the "nine days' fits," and sometimes indifferently trismus and tetanus neonatorum or nascentum. Colles,[6] at the beginning of last century, was apparently the first to identify the disorder with traumatic tetanus and to find the focus of infection in an "unhealthy or unkindly form of inflammation or ulceration of the umbilicus." But to Colles the word tetanus implied merely spasm, however produced.

FIG. 4.



A case in which the jaw was rigidly fixed in the open position with extreme spasm of the extremities.

In the 25 years ending 1782, of 17,650 infants born in the Rotunda Hospital in Dublin, 2944 died of trismus. Following improvements in ventilation and hygiene, the number fell rapidly from 17 per cent. in the above figures to 0·2 per cent. between 1826 and 1833. The decline elsewhere in these islands seems to have been steady, if especially in rural Scotland, more gradual until, by the second half of the last century, it lingered, like belief in witchcraft and the evil eye, only among the most remote and primitive communities. The story of St. Kilda is known to all. In 1860, of 125 children born to the 14 married couples in the island, 80 had lost their lives within 14 days, almost all of trismus. Up to 1890 the scourge continued unabated, when it ceased under the administrations of Nurse Chisnall, a Gaelic-speaking nurse, who consented to be marooned on the island for the winter, taking with her a plan of action worked out by Dr. W. L. Reid of Glasgow, a knowledge of the importance of cleanliness, and a plentiful supply of iodoform for the cord.[7]

Elsewhere on the edge of civilisation the disease continued its ravages, especially among the black population in the West Indies, in the Southern States of America, in the Balkans, and in India. In parts of India to-day it is still appallingly common. Thus the annual reports[8] of the Sanitary Commissioner with the Government of India for 1919 state that the deaths from tetanus in some towns and districts are over 50 per cent. of the total infant mortality, which itself stands at a figure of from 20 to 30 per cent. of live births.

A mortality so vast and so continuous among any population so long as it is ignorant of precautions against sepsis, and so easily controlled by the introduction of such precautions, seems more likely to be the direct result of septic infection of the newly-born than to be due to the accidental contamination of the umbilical wound with the bacillus in each and every case. In general the search for the bacillus proves quite in vain. For an account of numerous post-mortem examinations carried out at a time and in a district when the disease was still very common, I may refer to a description by Hartigan,[9] published a month or two before the discovery of the tetanus bacillus. From the descriptions of the older observers in all countries one point only emerges, that the spinal cord and meninges were very vascular. In many there were noted "extravasations of blood," "deposits of fibrin," or "extravasations of lymph." Hartigan, besides analysing the results of previous post-mortem examinations, himself conducted 23 autopsies in most of which extravasation of blood-stained lymph was found around the spinal cord. He gives a good microphotograph of the histological appearances, showing lymph around the cord. That same year the tetanus bacillus was discovered by Nicolaier. Since then it has been tacitly assumed that trismus and tetanus are identical. This assumption, and the increasing rarity of the severe and fatal forms of the disease, has made the post-mortem records of recent years few and unsatisfactory. In the post-mortem reports of my own hospital, at Guy's, I can find notes of only two recent post-mortem examinations. In one the notes and apparently, the examination, are too scanty to be of any value. The other was very fully examined by Prof. Laidlaw, and it is significant that this infant died with infective endocarditis on the tenth day of life. Numerous vegetations were found on the valves of the heart. The umbilicus was unhealthy, but the condition of the brain and cord is not stated.

Trismus neonatorum, then, I believe to be no more than a manifestation of sepsis neonatorum. In some few cases the muscular spasm is so prominent a symptom as to dominate the clinical picture, but in a high proportion of all cases of sepsis some degree of muscular rigidity, and some definite interference with the art of suction, is present. My own experience convinces me that the minor degrees of trismus in sepsis are not uncommonly met with even to-day. In infancy, the accidental importance of the act of suction, the one powerful coördinated muscular action of which the child is capable, has focused attention upon the jaw muscles and has led to the confusion with tetanus.

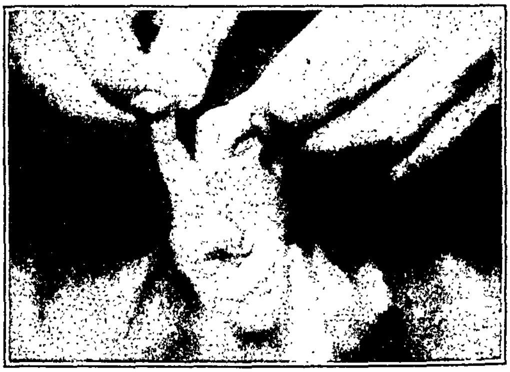
PREVENTION OF SEPSIS NEONATORUM.

To prevent sepsis neonatorum we must keep three objects in view: (1) We must remove all sources of infection. (2) We must protect, so far as is possible, all portals of entry, especially the skin, the umbilicus, and the mouth, from irritation, excoriation, and infection. (3) We must strengthen in every way possible the child's power of resistance to infection.

Let me consider each of these three points in turn.

1. The chief risk to the newly-born is from the person of the attendant. Especially dangerous is any septic sore or abrasion upon the skin of her hands. Not infrequently an epidemic of pemphigus or dermatitis exfoliativa among the newly-born in a district has been traced to such a septic point on the hand of a particular midwife. Impetigo among the older children in the family is also responsible for many cases. Pyorrhœa alveolaris in a midwife who constantly wets her fingers in saliva, and purulent nasal or bronchial secretions is another source of danger. One of the worst cases which I have encountered in a comparatively well-to-do family was caused by a nurse with a sore place, quite small but very unhealthy, at the angle of her mouth, which had been present some days before the birth and which, as she spoke to me, she touched more than once. The increasing attention paid to such matters is probably the explanation of the remarkable decline in the incidence of sepsis neonatorum. It is interesting to note that, for the same reason, osteomyelitis has become a comparatively rare disease because the percentage of children going about their ordinary life and exposed to trauma, while suffering from local pyogenic skin infections, has so greatly diminished. There is reason to believe that a century ago such skin infections were almost universal and too little infections were almost universal and little regarded.

FIG. 5.



The hand of Case 4 photographed some months later, showing permanent deformity of the fingers. The middle finger is being extended to the utmost of which it is capable.

2. In very many cases infection takes place through the skin. The skin of the newly-born is peculiarly ill-fitted to stand contact with infection. The epithelium is very thin and, especially the protective horny layer, is little developed. In all cases, but in very varying degree in different infants, there is visible desquamation of the most superficial layers in the first days of life. In the papillæ, which are also poorly developed, there is a well-marked network of vessels, which is situated so superficially that its presence goes far to explain the great tendency to exudative and serous processes, as for example, urticaria, pemphigus, and so forth. While the sweat glands are poorly developed, the seborrhœic glands are large and numerous, as we might expect from the frequency of seborrhœic disturbances. The study of the microscopic structure of the skin of the newly-born shows perhaps better than in any other way the danger to the infant of friction in removing the vernix caseosa, or in drying, of reflex scratching, and generally of irritation from contact with urine and fæces.

Pemphigus and Dermatitis Exfoliativa.—In the skin of the newly-born, with its peculiar structure, impetiginous infection shows itself in two characteristic forms of rash—i.e., the discrete form, pemphigus, and the confluent, dermatitis exfoliativa. In pemphigus a number of large superficial bullæ rapidly form, filled with serous, later with turbid, contents. The bulla soon ruptures, discharging fluid, and leaving a circular area, moist and bright red, outlined by a ring of the separated epithelium which still remains adherent. In the diffuse or confluent forms known as dermatitis exfoliativa, large areas of the deeper layers of the skin are exposed, while the remains of the superficial epithelium hang adherent here and there in shreds and patches like pieces of soaked tissue paper. The appearance may be so like that of a scald that I have known this diagnosis made despite the protests of the mother that no scalding had taken place. These profuse and rapidly spreading rashes, repeating at each point the same appearance, should be readily distinguished from syphilitic eruptions, with which they are nevertheless often confused. It is well to bear this in mind, because almost always the suggestion that the rash is syphilitic has been made by some irresponsible person. In the past the mortality has been high. The older writers (Corrigan, 1834) spoke of a 90 per cent. mortality. In my own experience the mortality has not been high. Probably the fatal cases are those in which a generalised infection is added with cerebro-spinal involvement—trismus and convulsions—and these have grown rare with the decline of severity in this type of skin infection. The umbilicus is always infected secondarily in pemphigus and dermatitis exfoliativa, and as a primary source of infection it plays a considerable part. The danger is especially great when the cord has been very thick and has remained adherent for an unusually long time. In such cases the desiccation of the cord does not proceed satisfactorily, and a moist gangrenous process is apt to be substituted for a dry.

Sometimes it is clear that infection of the skin has taken place by contact with fæces and fæcal organisms. A deeply eroding pustular eruption of the buttocks, spreading from the anus, to which the name echthyma gangrenosa varicelliforme has been given, may in turn give rise to a generalised infection. Trauma, to the delicate mucous membrane of the mouth, is apt to result from any attempt to cleanse the cavity by friction, however gentle. The utmost cleanliness and the greatest gentleness in handling the infant is very necessary.

3. Breast-nursing—a great gain for the healthy baby—becomes all-important for the baby with septic infection. In trismus, nasal or œsophageal feeding with milk expressed from the mother's breast is the best plan. Blood transfusion, if quickly and dexterously carried out, no easy task in a young infant, may save life.

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THE CLINICAL SIGNIFICANCE OF HYPERBILIRUBINÆMIA.

BY H. G. MOGENA, M.D.

(From the Medical Clinic of the General Hospital, Madrid).

THE clinical significance of the estimation of the various bodies that are found normally or pathologically in the blood becomes steadily greater. To obtain these estimations in everyday practice simple methods are essential; these have been perfected for the estimation of urea, glucose, chlorides, calcium, and creatine. Bilirubin-determinations have revealed latent jaundice in obstruction of the bile-ducts, early hepatic cirrhosis, after treatment with the arsenobenzols, in secondary carcinoma of the liver, and in hepatic insufficiency. On the other hand, they prove the absence of jaundice in subjects tinted with other pigments such as carotin, or in patients whose straw colour might suggest subjaundice. If, as modern theories state, bilirubin is formed in the endothelial tissue and the hepatic cell is only a filter through which it passes, variations in its amount in the blood would be expected in diseases of that tissue, or when the hepatic cell does not allow circulation of the bile, or whenever elimination of the bile through its ducts is totally or partially obstructed.

Several methods of estimating bilirubin have been proposed: (1) comparison of different dilutions of the serum with a standard solution of potassium bichromate (Meulengracht, Gram, Berhardt and Mans, Erst and Förster); (2) transformation of bilirubin into biliverdin by oxidation (Gilbert and Herscher and Herzfeld); (3) combination of bilirubin with the diazo-reagent and estimation by a standard solution (H. van den Bergh). The first method, though quite simple, is useless for small quantities and has the disadvantage of requiring comparison of intensities but not of colourations. The van den Bergh method, much used recently, depends on the reddish colouration that bilirubin shows in a neutral medium when mixed with Ehrlich's diazo-reagent; in an acid medium the colour becomes bluish-purple. This reaction is very sensitive; the estimation is made by comparison with a standard solution. Bilirubin was first employed by the author, but on account of the difficulty of obtaining and preserving it he substituted an ethereal solution of iron sulphocyanide. Haselhort uses a mixture of Bordeaux red and methyl-blue, and Thannhäuser and Andersen a solution of bilirubin in an acid medium. The diazo-reaction does not take place with biliverdin, and this is often inconvenient if the examination is delayed. The presence of a substance that is not bilirubin renders the procedure uncertain. Herzfeld criticises the van den Bergh method on the ground that the amount of bilirubin in the alcoholic extract may vary with different quantities of bile and also with the alkalinity of the blood. By increasing this alkalinity with sodium bicarbonate they extracted with the alcohol large amounts of bilirubin. Furthermore, van den Bergh believed that only bilirubin gave a red colouration in an acid medium; but Herzfeld has seen indol and pyrrol produce the same effect, the test being 200 times as sensitive to the latter as to bilirubin or indol. Indol in the blood comes from the hæmoglobin and gives rise to a series of pyrrolic bodies.

Technique of Herzfeld's Method.

The method founded on the transformation of bilirubin into biliverdin is quite simple and very exact, and we have used it in many cases.

Into a series of test-tubes we put 1 c.cm. of water, except that the first tube has 1 c.cm. of undiluted serum. To the water in the second tube we add 1 c.cm. of serum and from this mixture of serum and water we take 1 c.cm. and put it into the third tube and so on with the rest, repeating the dilution until a colourless mixture is obtained. Then to every tube is added a few drops of freshly prepared Hammarster's reagent, the limit where light green colouration appears being noted against a white background. The Hammarster's reagent is prepared by mixing one volume of 25 per cent. nitric acid with 19 volumes of 25 per cent. hydrochloric acid; we let it stand 24 hours before use and keep it for one year. At the time of use we mix one volume with four of alcohol. The colouration of these tubes is compared with others that contain a known dilution of bilirubin. Frigyer, in order to get greater accuracy, made a 1 in 10 dilution with the last tube.

The advantage of this procedure, besides its simplicity, is that the comparison is made with a similar solution of bilirubin. Van den Bergh believes it possible to differentiate the types of jaundice according to the behaviour of the serum with the diazo reagent. He noticed that the serum of patients suffering from obstructive jaundice gave the reaction with Ehrlich's reagent without the addition of alcohol, while in the serum of patients suffering from hæmolytic jaundice or pernicious anæmia the combination does not occur at all or occurs only after a certain time and incompletely; these serums gave the reaction quickly and normally if alcohol was added. The first reaction is called "direct," the second "immediate indirect" if it appears in a few seconds and completely, after the addition of alcohol, and the third "delayed indirect" if it takes place more than half a minute after the addition of alcohol and partially. Feigl has applied the term "diphasic reaction" to a slight change appearing at once and then ceasing. The different reactions of jaundice serums, van den Bergh thinks, may be due to a slight difference in the chemical composition of the bilirubin molecule or, more probably, to a binding of the molecule of bilirubin with albuminoid bodies in the serums giving delayed reaction, this union being broken before the reaction can be produced. Adler and Strauss, after numerous experiments, believe that it corresponds with physico-chemical modifications of the serum and that both the direct and indirect reaction in the serum of icteric subjects or of those with some blood disease differ essentially in their colloidal reaction.

As a result of our investigation we cannot admit that the van den Bergh reaction is useful in distinguishing the different kinds of jaundice. We often find an immediate direct reaction when the serum is rich in bilirubin, and when the proportion of bilirubin is small a delayed or indirect reaction is sometimes shown. The different reactions of the serum with Ehrlich's reagent depends, according to us, more on the quantity of bilirubin than on the way this has been formed. Friedmann and Strauss found in some cases that, while the indirect reaction is positive only at the beginning of jaundice, later the direct reaction occurs immediately and distinctly. Barchi also has observed that the rapidity with which the direct reaction appears depends on the concentration of bilirubin in the blood; it is therefore useless as a criterion by which to distinguish the nature of jaundice; dynamic jaundice responds to the diazo-reaction in the same way as the so-called static jaundice does.

Bilirubin in the Normal State.

The amount of bilirubin in the blood varies according to different authors and their estimates depend perhaps on the method used. According to van den Bergh it varies between 0·2 and 0·6 units, which corresponds with 0·1 to 0·3 mg. per cent. Jenndrasik and Czirke, using a modification of the former's technique, found higher amounts, and if the determinations are carried out on the plasma instead of the serum the quantity is still greater. Haselhort, Scherk, and Cowen give 0·5 mg. as an average quantity. In Wiener's opinion the normal amount is 0·8, a figure also found by Botzian. Förster and Förstener think that 1 mg. per cent. is the limit. Herzfeld, using his own technique, found in normal subjects from 1·6 to 6·25 mg. per cent., a figure 20 times as high as those obtained with the van den Bergh technique. Our observations with Herzfeld's technique have shown that bilirubin does not normally exceed 6·25 mg. per cent.; higher figures are a sign of functional disorder of the liver or of obstruction to the flow of bile. Schiff has cited figures a little higher for men than for women; Ernst and Förster found a greater quantity of bilirubin in normal persons when fasting than after meals, the variations fluctuating from 0·1 to 0·2 mg.; Brown and his assistants found some greater differences. According to Förster and Förstener this increase is probably due to the elimination of bilirubin from the blood during the digestive phase. Hooper and Whipple have observed that after the ingestion of carbohydrates the serum-bilirubin transitorily increases because, they think, the starch stimulates the elimination of the pigments already formed. Meyer and Knüpffer noted a decrease of bilirubin between the second and third hour after meals in normal subjects, this diminution being greater in the fifth hour but disappearing after eight hours, when the bilirubin begins to increase. They also found an increase when the subject fasted all day or when milk or rice or barium sulphate was administered. On the other hand, the ingestion of a litre of water did not bring about any alteration.

While many people with hepatic trouble show a normal amount, others have a hyperbilirubinæmia after food ingestion that might be explained by reabsorption of bilirubin through the intestine and its passage to the disordered liver. Perkin has noted a relation between the quantity of bilirubin and the skin pigmentation, the bilirubin being greater in swarthy subjects than in fair ones. H. van den Bergh calls a slight increase of pigment, which might correspond either to Gilbert's "familial colæmia," or to the "bilious temperament" of other authors, a "physiological hyperbilirubinæmia." We regard this increase of bilirubin as invariably pathological, a sign of latent jaundice.

Bilirubin in Pathological States.

The course of a jaundice is empirically estimated by the colouration of the tissues and urine; this depends not only on the quantity of pigment present but also on the dilution—i.e., the amount of urine eliminated. Both procedures are rough enough and can only be relied on to reveal gross variations of pigmentation that need several days to produce. Bilirubin has been regarded as an echelon body, like glucose for instance, so that the pigment only begins to be eliminated through the urine when it reaches a certain concentration in the blood. For the subicteric tinge to be perceptible the blood-pigment must reach 50 mg. by Herzfeld's method which, as we have stated, gives us figures 20 times as high as van den Bergh's. The majority of authors have found with this method or any similar one that from 2·5 to 3 mg. per cent. of bilirubin must be present in the blood to give visible jaundice. The evolution of jaundice can be rapidly and certainly followed by examining the serum bilirubin quantitatively, and there is no need to emphasise the diagnostic and prognostic importance of exacerbations or remissions of jaundice, especially after surgery of the biliary passages. The determination of pigment in the blood is of great advantage for the diagnosis of cholecystitis, both in its quiescent stages and in acute attacks. While diagnosis of hepatic colic is usually easy, it may at times cause confusion. When the bile obstruction is complete and lasts a certain time, the presence of bile-pigments in the urine or commencing jaundice will be valuable data; but if the obstruction is partial or of short duration, then the bile retention will not have been enough to dye the tissues or to appear in the urine, even though there is hyperbilirubinæmia. In these doubtful cases blood should be tested from 12 to 24 hours after the commencement of the attack. If there is a disorder of the biliary passages, there will be an increase of bilirubin in this specimen over that taken when the patient was quite well; the differences, of course, are not great or there would be obvious jaundice. In this way it is possible to distinguish the hepatic colics from those arising from other sources such as kidneys, appendix, intestine, stomach, or urethra.

Takats recently saw an increase of bilirubin in 15 cases of hepatic colic without jaundice; he examined the blood every four hours and believes that the increase of pigment after the colic is due to a rapid increase of tension in the bile-ducts. The hyperbilirubinæmia lasted one or two days; when atropine was administered there was a decrease, which might be explained by muscular relaxation and better passage of bile through the excretory ducts.

In cases of cholecystitis, even in the intervals of the attacks, we can detect pigment increase, a sign of latent jaundice. Friedmann and Strauss find increase of pigment in 93 per cent. of cases during the attack and 63 per cent. in the intervals; they account for it either by the greater reabsorption of pigment through the walls of the inflamed gall-bladder or by an expansion of the inflammatory process, or of the bile-duct obstruction. According to William Bloom, ligature of the cystic duct of dogs does not produce an increase of bilirubin in the blood, which would explain the lesser degree of hyperbilirubinæmia that Friedmann and Strauss found in the intervals of the attacks.

Kehr states that 51 per cent. of patients suffering from cholelithiasis have jaundice (transitory, recurrent, or continual), while of those harbouring calculi without showing symptoms only 5 per cent. have jaundice; but a certain number of these have latent jaundice. The maximum degrees of hyperbilirubinæmia are naturally found in cases of severe jaundice, when there is common bile-duct obstruction from impacted calculus, cancer of the head of the pancreas, or angiocholitis, and in these cases we only use the bilirubin test to estimate the course of the jaundice.

The study of hepatic insufficiency has also been advanced by this test. In experimental degeneration of the hepatic cell produced by phosphorus injection into dogs the elimination of phenoltetrachlorphthalein through the bile was delayed as the amount of bilirubin in the serum increased. This relation between bilirubin and the retention of dye has also been proved by Snell, Greene, and Rowntree. In man we have seen after chloroform anæsthesia increase the amount of bilirubin by liver damage. Given equal quantities of anæsthetic the increase of the biliary pigment will depend on the liver state; the already diseased cell will tolerate the chloroform worse and the hyperbilirubinæmia will be greater; when it is not severe enough to produce jaundice only serum examination reveals the hepatic lesion. At the same time bilirubin can be injected into the blood stream and the time elapsing before its disappearance can be noted.

Diagnosis of hepatic cirrhosis that offers few symptoms at the beginning—so that diagnosis is usually only made at a late stage—will be greatly helped by the determination of bile-pigment. We have found in hypertrophic cirrhosis, many years before an icteric tint appeared, a small hyperbilirubinæmia which, together with some digestive troubles and the result of the bile examination, put us on the track of an early diagnosis. In most cases of portal cirrhosis with ascites Greene, McVicar, Snell, and Rowntree have noted that the amount of blood bilirubin was not increased. There is an early increase of pigment in most cases in which there is a gland lesion, and during the digestive periods, especially if hepatic insufficiency exists, there is a slight hyperbilirubinæmia which is often found, also, during menstruation. We have found it, though not above 4 mg., in subjects with cardiac weakness, specially of the right ventricle; the degree of weakness bears a close relation to the amount of bilirubin, but we do not agree with Gottlieb that this is an infallible guide to prognosis. In all cases of active or passive congestion of the liver there is an increase of bilirubin; Schiff found the highest amounts in patients with mitral lesions. Pigment increase has been recorded in pneumonia, but we have been unable to confirm this in five cases; it may only be present in pneumonia of the right base, thus giving rise to the belief that there is an anatomical relationship by which secondary hepatitis is produced. The great increase of urobilin in the blood of pneumonic patients cannot support the idea of a consecutive hepatic lesion, since this urobilin might be formed in the diseased lung.

The presence of jaundice in a syphilitic patient under arsenical treatment has given rise to much literature, some authors regarding it as specific but most as due to the toxic action of the drug on the liver. We have seen many cases in which treatment with neosalvarsan was followed by jaundice and phenoltetrachlorphthalein retention; rest, a non-toxic diet for the liver, and the discontinuance of the drug sufficed to dispel the jaundice, but the bilirubin increase went on for some time and increased markedly when we again injected a small dose of neosalvarsan. Two patients treated with bismuth preparations did not show an increase of pigment. The small percentage of cases in which jaundice occurs shows that it is due to a functional insufficiency in some cases produced by specific hepatitis; the determination of the bile-pigment in the blood will disclose that insufficiency. Chargin and Orgel and Covisa advise making this estimation in every syphilitic patient who has arsenical treatment to foretell those who are liable to jaundice and thus to avoid it. Schamberg and Brown suggest using it from time to time to see how the liver is reacting to the drug. Some headaches have biliary causes, and these cases can be distinguished by this test.

Takats found hyperbilirubinæmia in pernicious anæmia, while in secondary anæmia, especially if due to cancer, the amount is normal or reduced. This test is therefore useful for differential diagnosis. Gottlieb noted hyperbilirubinæmia in malaria and still more in typhoid fever. Bang says that hyperbilirubinæmia is always a symptom of severe appendicitis produced by concomitant toxic hepatitis.

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THE ICTERUS INDEX OF THE BLOOD SERUM.

By G. W. MILROY, M.D. Edin.,
LATE HOUSE SURGEON TO THE ROYAL INFIRMARY, EDINBURGH, AND THE ROYAL ALBERT EDWARD INFIRMARY, WIGAN.

At the present time clinicians are showing a markedly increased interest in the study of diagnostic methods designed to increase our knowledge of the functional activity of the liver.

Probably the latest development in liver function tests is that described by Bernheim,[1] called the icterus index. This index is an estimation of the bilirubin content of the blood serum; it is not a true quantitative estimation, but an estimation by means of a colorimeter of the intensity of the staining of the serum by bilirubin as compared with an arbitrary standard of colour. Variations in the normal amount of bilirubin in the serum are caused by: (1) disturbances of the biliary system, (2) hæmolytic conditions, (3) toxic conditions, and it is claimed by Bernheim that by means of the icterus index a hyperbilirubinæmia caused by any of the above can be detected and that, once detected, the variations in the icterus index in different diseases are of value in diagnosis, treatment, and prognosis.

I have carried out observations on a series of cases of various diseases with a view to confirming Bernheim's findings. The results obtained were not perhaps quite so consistent as those of Bernheim and other American writers, but the general impression obtained from the results to be given below was that in the icterus index we have a simple and accurate test for hyperbilirubinæmia which, if used in correlation with the clinical findings of the case, is of value in diagnosis, treatment, and prognosis.

Technique.

Venous blood is allowed to clot and the serum pipetted off and centrifuged until clear. The serum is then compared in a Dubosc colorimeter with an arbitrary standard of 1 in 10,000 potassium dichromate (0·05 g. in 500 c.cm. of distilled water). The indicator on the scale of the standard solution is set at a suitable figure (e.g., 15 or 20), and a reading of the "unknown" serum is taken at the point on its scale at which the two solutions match. The index is then calculated by dividing the reading of the standard by that of the unknown. With deeply pigmented sera dilution may be necessary before an accurate reading can be obtained. This dilution must be made with normal saline, and when the calculation is made the figure obtained must be multiplied by the number of dilutions. Thus we find that the deeper the colour of the serum the higher the icterus index.

Errors and Fallacies in Technique.

1. The standard solution becomes paler on exposure to light. The addition of two drops of sulphuric acid per 500 c.cm. will preserve the colour.

2. The serum must be clear when the reading is taken, cloudy or lipæmic sera giving high faulty readings. Serum usually becomes opaque if allowed to stand for more than 24 hours, and is also cloudy during the ingestion periods.

3. Hæmolysis must be avoided, either by using dry sterilised needles to withdraw the blood or by washing syringes and needles in normal saline.

Several modifications of Bernheim's technique have been described. Both Brown[2] and Murphy[3] have devised methods which consist primarily in the comparison of the "unknown" serum with a series of dilutions of potassium dichromate in standard tubes. A similar method described by Davis[4] makes use of capillary blood, thus avoiding venepuncture.

The serum from 55 normal persons was examined and in every case the index lay between three and six. Also, in every case in the series with an index over six there was some pathological condition present. Normal indices, as was expected, were also found in some diseases such as renal, venereal, and gynæcological conditions, gastric ulcer and carcinoma of the stomach, rheumatic fever, and tuberculosis.

Gall-bladder Dysfunction, Duodenal Ulcer, and Appendicitis.

Sixteen cases of proved gall-bladder disease were investigated. Twelve showed active cholecystitis or cholelithiasis with obstructive symptoms; only five showed clinical jaundice. All gave indices between 10 and 50, and in every case the index returned to normal after operation. The remaining four cases showed indolent cholelithiasis and normal indices. It follows then that, while the icterus index will not indicate the mere presence of gall-stones, a raised index will appear as soon as there are any signs of active disease, even in the early stages before clinical jaundice appears. De Wett Stetten,[5] who showed that cases of suspected stomach disorder showing indices of nine or ten were found at operation to be biliary disease, suggested that the icterus index is a means of differentiating renal and biliary colic, acute appendicitis, and perforated duodenal ulcer. This is true up to a point, but my results do not enable me to make a definite distinction between all four.

Pathological renal conditions do not raise the icterus index, which fact may make a differential diagnosis between renal and biliary colic. It is with acute appendicitis and duodenal ulcer, however, that difficulty arises. Nineteen cases of appendicitis were examined; five showed indices between 6·1 and 7·8, and seven showed normal figures. The remaining seven were cases of chronic appendicitis and showed normal indices. Of 19 cases of duodenal ulcer, ten gave indices between 6·4 and 8·6; six gave normal figures, and three, which had recently had hæmatemesis, showed subnormal indices. In both these conditions then, as in biliary dysfunction, the icterus index may be raised. This at first sight may seem to confuse the issue, but it was found that the lowest index obtained in active biliary dysfunction was ten, whilst the highest due to duodenal ulcer was 8·6. One may therefore conclude that an index of nine or over points to gall-bladder trouble rather than duodenal ulcer or appendicitis.

The figures obtained with duodenal ulcer and acute appendicitis are more confusing. The former gave figures between 3·4 and 8·6, and the latter figures between 3·8 and 7·8. This does not enable one to differentiate the two conditions by the icterus index alone, although the average index (6·2) of duodenal ulcer as against the average of 5·5 for acute appendicitis shows a tendency to a higher figure in the former disease. The icterus index, therefore, is of little value in differentiating acute appendicitis and perforated duodenal ulcer. American writers regard a raised index as a constant accompaniment of duodenal ulcer and as a means of differential diagnosis from gastric ulcer, which shows normal figures. My figures did not show a constantly raised index in duodenal ulcer, though—as gastric ulcer invariably shows a normal index—in cases where the diagnosis lies between the two a raised index would indicate the former.

From the fact that the icterus index returns to normal after operation for gall-bladder disease it is reasonable to deduce that a raised post-operative index is indicative either of an overlooked gall-stone in the duct or, in old-standing cases, of an associated hepatitis, both of which involve a less favourable prognosis.

The icterus index is of great value in cases of frank or suspected jaundice where the need of a simple and practical method of accurately estimating the degree of jaundice present at a given time has long been felt. I investigated 13 cases of jaundice and found in all that the index rose or fell as the jaundice increased or diminished. The indices obtained varied from 14·2 to 243·2. It is generally agreed that 15 is the index at which clinical jaundice appears, though I have found it possible to have indices above 15 for a few hours with no clinical jaundice and vice versa, owing to the hyperbilirubinæmia being demonstrable before the tissues took on the icteric hue.

The advantages of a method of estimating the degree of jaundice and also its daily fluctuations are obvious when one considers, for example, the differential diagnosis between carcinoma of the head of the pancreas and an impacted stone in the common duct. The index is valuable, moreover, in assessing operative indications. In a case of biliary obstruction by stone, for example, it will permit us to determine increase or decrease of the jaundice, thus enabling us to decide whether to operate before the jaundice is too far advanced or to wait until it has subsided. The icterus index will probably prove of great value in the detection of jaundice in coloured races.

Hyperemesis Gravidarum, Pernicious Anæmia, and Secondary Anæmia.

Only two cases of hyperemesis came under observation, but in both the icterus index was raised, the figures being 8·1 and 10·7; the latter patient died. It seems probable that, if the icterus index behaves in these cases as in other diseases, it might be of value in prognosis if successive readings were made, and also in determining whether termination of pregnancy was advisable.

In eight cases of pernicious anæmia the index was raised to between 7·8 and 20, the last case being jaundiced. All were treated by liver; in every case there was a marked improvement in the blood picture in five weeks and the index fell to normal in the same period. It seems, therefore, that we have in the icterus index an additional indication of the prognosis of the disease. The fact that there is a raised index in pernicious anæmia and a subnormal one in carcinoma of the stomach provides an additional means of diagnosis.

Nine cases of secondary anæmia showed a low index, between 2·1 and 3·6. These low figures open up the possibility of a fallacy in icterus index readings, as it has been found that a patient suffering from a disease which usually raises the index, but who also has a secondary anæmia, sometimes shows a normal index, but always a much lower one than is to be expected from the principal condition.

Cardiac Disease.

Of seventeen cases of cardiac disease, twelve showed decompensation and the index varied from 6·9 to 25, and in every case rose or fell as the clinical condition became worse or improved. The remaining five cases with no decompensation showed normal figures. Bernheim states that every case in her series with an index over 12·5 died within a few weeks. My observations bear this out, and it seems that we have in the icterus index a method of following the progress of cases of heart failure, which is so difficult to estimate by clinical observation alone.

Cases under Arsenical Treatment.

Owing to the well-known vulnerability of the liver to arsenic, any test which could be employed as a routine and which would indicate the toleration of the liver for the drug would be of great value, for example in the treatment of syphilis by prolonged courses of arsenic. Twenty-two cases of syphilis under intravenous arsenical medication were examined, and the icterus index was taken every three weeks for varying periods. It was found that in the majority of cases the index remained normal, even after prolonged treatment. In a large percentage, however, there was a rise in the index at the commencement of treatment, followed by a gradual fall. In some cases the index rose above normal at this stage. This rise is apparently due to the toxic effect of the arsenic in persons unaccustomed to it, the return to normal denoting acquired tolerance. Two cases of arsenical dermatitis both gave a raised index which fell to normal with the cessation of treatment. In one of the cases when treatment was recommenced the index again rose above normal, to subside once more when a second "rest" was given. Two cases of arsenical hepatitis, both with clinical jaundice, showed markedly raised indices, one being 243·2, the highest in my series. In both cases the index fell to normal as they recovered under treatment.

The icterus index, therefore, anticipates toxic effects from arsenic. The blood can easily be withdrawn when giving an injection and should be examined at regular intervals. Patients with indices within "the period of latent jaundice" (i.e., 6 to 15), should be watched carefully, and a steady rise of the index through that period must be regarded as a danger signal. Similarly, in cases recovering from toxic hepatitis, a raised icterus index is a contraindication to the recommencement of arsenical treatment, despite the disappearance of clinical jaundice.

Pneumonia.

Eight cases of pneumonia showed indices between four and ten. Bernheim gives an index of 7·5 as the limit for a definitely favourable prognosis in pneumonia. My results bear this out, in that every case under 7·5 recovered and the higher the index the worse the clinical condition, but it is not possible to be dogmatic in prognosis since, though a high index is definitely less favourable, it has been shown by Bernheim that patients with an index as high as 15 may recover.

The chart shows at a glance the figures obtained in various diseases. It has been suggested that by comparing the index of any given case with the chart it would be possible to make a diagnosis. This, of course, is impossible, owing to the "overlapping" of the indices in various diseases, and one must deprecate any tendency to use the icterus index as a specific test while emphasising the necessity of bearing in mind the clinical findings in every case, the index to be used as an additional factor in diagnosis.

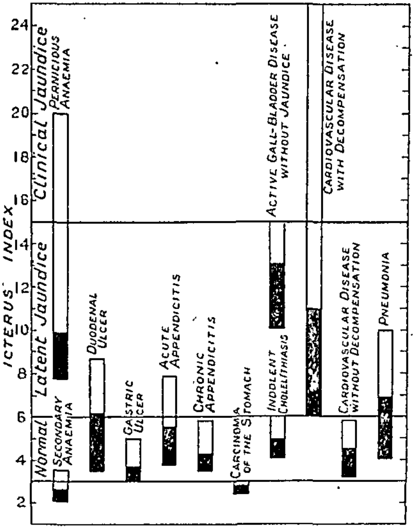

Diagram showing the icterus index in various diseases. The solid black areas represent the minimum to the average index. The white areas represent the average to the maximum index.

In conclusion, I would emphasise particularly the value of the index in: (1) distinguishing biliary conditions from renal, gastric, duodenal, and appendicular conditions; (2) differentiating carcinoma of the stomach and pernicious anæmia; (3) controlling toxic effects due to arsenical medication; (4) detecting variations in clinical jaundice.

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DONATIONS AND BEQUESTS.—Sir John Robinson, of Worksop Manor, Notts, brewer, besides other bequests, left all his stock, shares, debentures, and other interests in the New Leicester Club and County Racecourse, Ltd., for division into ten parts, of which he left four parts each to the Nottingham General Hospital and the Victoria Hospital, Worksop, and one part each to St. Dunstan's Hostel for the Blind and the Nottingham and Nottinghamshire Adult Deaf and Dumb Society; £5000 for the endowment of almshouses, and £5000 to St. Dunstan's Hostel for Blinded Sailors and Soldiers.—Mr. Frederick Victor Johnson, of The Limes, Barlaston, Stoke-on-Trent, left £1000 to the North Staffordshire Royal Infirmary.

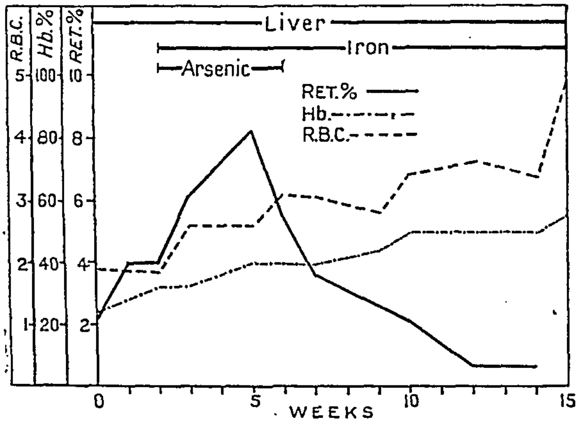
LIVER THERAPY IN SECONDARY ANÆMIA.

BY S. C. DYKE, D.M. OXF., M.R.C.P. LOND.,
CONSULTING PATHOLOGIST, THE ROYAL HOSPITAL, WOLVERHAMPTON.

THE efficacy of liver, either as whole gland or in some suitable preparation, in restoring to normal the blood picture in primary or pernicious anæmia is now one of the firmly established facts of medicine. Its effects in secondary anæmia are by no means so clear. So startling were the early results obtained by liver treatment in pernicious anæmia and so relatively meagre the results in the secondary anæmias that there was an initial tendency to deny any usefulness to this form of therapy in the treatment of any form of anæmia other than Addisonian. The experimental work of Whipple, Robscheit, and Minot and Murphy, which led to the application of liver therapy to the treatment of pernicious anæmia, was carried out on dogs rendered anæmic by repeated bleedings and therefore suffering from secondary anæmia, and it is difficult to believe that what was experimentally found to be effective in dogs should not be clinically effective in human beings. How carefully this experimental work was controlled and how accurately the response to treatment was estimated can only be appreciated by a study of the original papers. It is, however, open to doubt whether under the less carefully controlled conditions of clinical work the responses obtained would have been regarded as definitely significant; certainly they were not of the same order as those obtained by the use of liver in human pernicious anæmia.

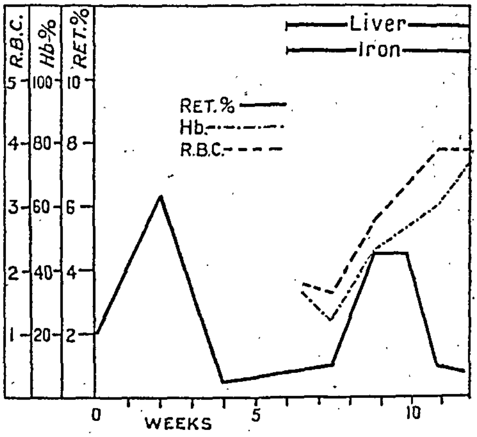
The present investigation was undertaken to ascertain whether any definite response to liver therapy could be obtained in human secondary anæmia. One reason for our lack of knowledge on this subject is undoubtedly the fact that secondary anæmias do not constitute a well-defined entity like Addisonian anæmia. They form a large and amorphous group falling roughly into two classes, depending upon whether the anæmia is due to hæmorrhage, acute or chronic, or to the action of some "toxin." In anæmia following acute hæmorrhage it is almost impossible to disentangle the effects of therapy from the natural recovery process; in cases associated with chronic hæmorrhage the response to therapy is obscured by the possible continuance of the bleeding, and in cases due to the action of "toxins" treatment must be directed to the eradication of the toxin; when this has been accomplished it is impossible to differentiate the results of the treatment from that directed immediately towards remedying the anæmia.

FIG. 1 (Case 1).



The mere study of the red cell count and hæmoglobin content of the blood will in many cases give little valuable information about the response to treatment. Some help, however, may be given by the "reticulocyte response." It has been shown by Greener and the present author[1] and by many others that the immediate effect of the application of liver therapy to a case of pernicious anæmia is the appearance in the blood stream of many reticulated red cells or reticulocytes; this "reticulocyte response" is invariable in cases responding well to treatment and serves as a most valuable index to the degree of the response. In secondary anæmia Vaughan[2] has been able to find evidence of this response, though not of the same order as that in primary anæmia. Minot, Murphy, and Stetson[3] also found definite evidence of a reticulocytosis in certain though not all of their cases of secondary anæmia. These authors, working mainly on pernicious anæmia, appear to have established a very high standard of response; they do not publish full tables of their results in secondary anæmia, but it appears from their discussion of these cases that had they accepted a lower standard many more of their cases would have been accepted as showing a response. Various other authors have brought forward evidence of the beneficial effects of liver therapy in cases of secondary anæmia without, however, having paid any attention to the reticulocyte response; among these Molfino [4] has reported striking results.

FIG. 2 (Case 2).

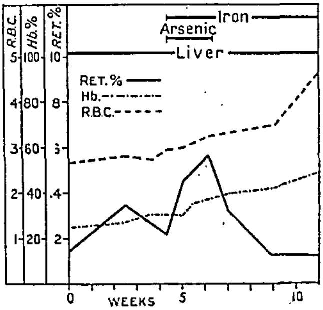


I have tested the response of a dozen cases of secondary anæmia to liver treatment. In many of these cases the anæmia was of long duration and in some it proved impossible to trace its source. In five, however, the anæmia definitely dated from a hæmorrhage or a series of hæmorrhages, in two due to gastric ulceration, and in the remaining three associated with parturition or abortion. Of all the cases investigated only these five showed definite improvement under the liver treatment. In four there was a definite increase in the reticulocyte percentage early in the course of the liver treatment; one case failed to show a response. In the cases showing a reticulocyte response the exhibition of the liver was followed by an increase in the red cells and in the hæmoglobin percentage; in the one case showing no response there was no increase in the red cells, and such improvement as occurred in the hæmoglobin percentage may, with some probability, be attributed to the action of the iron given with the liver.

Cases showing Reticulocyte Response.

CASE 1.—Female, aged 41, had a history of indigestion for two years; ten days before admission she had vomited about two cupfuls of blood and thereafter brought up small quantities at irregular intervals. There was also melæna. She was admitted on March 24th, 1928, and was treated by alkalis and diet until April 18th, when, although the melæna had ceased, it became apparent that the anæmia was not improving. A blood count showed 1,990,000 red cells per c.mm., hæmoglobin 25 per cent., and reticulocytes 2·4 per cent. of red cells. At this time it was discovered that the patient was three months pregnant. She was placed on a dose of two ounces of liver extract (Oxo) daily. On May 15th a mixture of iron and arsenic was added. On May 29th this was replaced by pil. ferri, grs. 5, t.d.s. The progress is shown on Chart 1.

FIG. 3 (Case 3).



CASE 2.—Male, aged 57, had a severe hæmatemesis on July 1st, 1928, and was admitted on the following day. He was very pale, had much melæna, and his pulse was feeble. He was treated by alkalis and diet with much improvement; melæna persisted until July 14th. He was discharged on August 20th considerably improved but still anæmic. At this date the blood showed hæmoglobin 30 per cent. and red cells 1,890,000 per c.mm. On August 27th the patient was seen again and it was obvious that he was making no further improvement. His red cells numbered 1,810,000 per c.mm., and his hæmoglobin 25 per cent. He was treated as an out-patient on liver extract (Oxo), half an ounce thrice daily, and pil. ferri, grs. 5, t.d.s. Subsequent progress is shown on Chart 2.

CASE 3.—Female, aged 37, had had ill-health since the birth of her last child two years previously, at which time she had lost a great deal of blood. She was seen as an out-patient on April 21st, 1928, when she was pale, had œdema of the ankles, a large ulcer on the right shin, and a loud, rough mitral systolic bruit. The Wassermann reaction was negative, the hæmoglobin 26 per cent., and the red cells 2,620,000 per c.mm. She was admitted on May 7th, and treated by liver extract ("Hepatopson"), half an ounce thrice daily. As shown in Chart 3, the blood picture improved until May 22nd, when the condition became stationary. The patient was then put on a mixture of iron and arsenic; from June 4th this was replaced by pil. ferri, grs. 5, t.d.s., with liver extract as before. Her subsequent course is shown on Chart 3.

CASE 4.—Female, aged 42, had an abortion on Dec. 16th, and was curetted on Dec. 19th, 1928. Since then she had been very pale and weak with swelling of the ankles. The hæmoglobin was 27 per cent., the red cells 1,310,000 per c.mm., the colour-index 1·04, and the reticulocytes 1·6 per cent. of red cells. She was admitted on Jan. 10th, 1929, and treatment commenced with liver extract (Oxo), two ounces daily, and pil. ferri, grs. 5, four times daily. Four days later the hæmoglobin had risen to 29 per cent. and the red cells to 2,300,000 per c.mm., while reticulocytes were present to the extent of 8·4 per cent. of red cells. This striking response, together with the rather high colour-index at the first count, led to the suspicion that this might be a case of pernicious anæmia. That this was not so was shown by the presence of free hydrochloric acid in normal amounts in all specimens from a fractional test-meal. The subsequent progress of the case is shown in Chart 4.

Case showing no Reticulocyte Response.

CASE 5.—Female, aged 25, had a post-partum hæmorrhage on July 4th, 1928, since when she had been pale and easily tired. She was seen as an out-patient on Oct. 8th, when she was still nursing the child, and her hæmoglobin was 39 per cent., her red cells 4,100,000 per c.mm., and her reticulocytes 1·3 per cent. of red cells. She was treated as an out-patient with liver extract (Oxo) two ounces daily, and pil. ferri, grs. 5, t.d.s. The red cell count showed little alteration and four months from the commencement of treatment still stood at 4,300,000 per c.mm. The reticulocytes also showed no increase at any time during the exhibition of the liver extract. The hæmoglobin, however, rose steadily until by February, 1929, it stood at 70 per cent. The general condition of the patient steadily improved. It is probable that in this case the improvement was entirely due to the iron.

In using the reticulocyte percentage to gauge the response to therapy which aims at the stimulation of blood formation after hæmorrhage, it is very necessary to bear in mind that hæmorrhage alone is followed by a marked increase in these young red cells. Chart 5 shows the response in a patient who had a severe gastric hæmorrhage and who received no treatment but rest, alkalis, and diet. The graph is plotted from the fourth day after the hæmorrhage and shows the reticulocytes standing at 8 per cent. of the red cells; four days later they have dropped to the neighbourhood of 2 per cent., a level which they thereafter maintain in spite of a progressive improvement in the blood picture. The normal response of the reticulocytes to hæmorrhage is also shown in Case 2, in which, before the commencement of any treatment aimed at the improvement of the blood picture, they attained a level of 6·1 per cent. Six weeks later they had fallen to about 1 per cent. and the patient was becoming more and more anæmic. This is an illustration of the fact, further exemplified by Cases 1 and 4, that in certain instances of anæmia due to hæmorrhage the production of reticulocytes may fall in spite of the demand for new red cells.

The Value of Iron.

Minot, Murphy, and Stetson, in the paper referred to above, have produced evidence that in the secondary anæmia which they produced by controlled bleedings in their dog experiments, improvement of the blood picture could be brought about either by liver or by iron. They further state that "the influence of feeding large amounts of liver or liver extract with large doses of iron can sometimes produce an effect which is not observable from the administration of either alone."

FIG. 4 (Case 4).

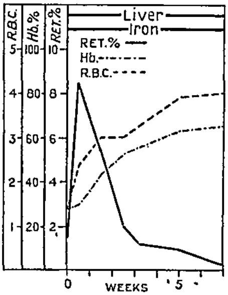
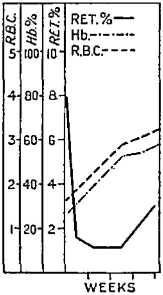


FIG. 5 (Case 5).



Some light is thrown upon the effect of the administration of iron along with liver by Cases 1 to 4. In Case 1 it will be seen that after two weeks' treatment by liver alone the blood count had, in spite of an initial rise of the reticulocytes to 4 per cent. of the red cells, become stationary. When iron and arsenic were given the reticulocytes rose rapidly to 6·1 and later to 8·2 per cent. and the blood count again improved, an improvement which was maintained in spite of a later fall of the reticulocyte percentage. This rise was maintained after the arsenic had been discontinued and the patient was on iron and liver alone. In Case 3 the same phenomenon appears. In spite of a slight rise in the reticulocytes, the blood count as a whole showed little improvement on liver treatment alone for four weeks; on the exhibition of iron and arsenic the reticulocytes rose to nearly 5 per cent., and the improvement in the blood count was maintained when the arsenic was stopped.

The continued improvement of the blood count in these two cases, after the withdrawal of the arsenic and while the patients were on liver and iron alone, raised doubts as to the efficacy of arsenic in cases of this sort. The effect of iron and liver only is shown in Cases 2 and 4. In Case 2 a good reticulocyte response followed liver therapy, but unfortunately in this case the behaviour of the red cells was not observed during this period. Six weeks from the commencement of the liver therapy the patient was put on iron as well; this was followed by a rise of the reticulocytes to over 4 per cent. and by the rapid improvement of the blood picture, shown in the graph. Case 4 received iron and liver from the initiation of treatment, a fact which may account for the very marked reticulocyte response shown by this case, and for the rapid improvement of the blood picture. In Cases 1 and 3 the improvement in the blood picture persisted after the arsenic had been dropped.

The series is too small to justify any extensive deductions, but it shows quite clearly that in certain cases of secondary anæmia following hæmorrhage liver or a suitable liver extract has a markedly beneficial effect in improving the blood picture and, further, that this effect is enhanced by the use of iron along with the liver. The fact that those cases in which there was a reticulocyte response early in the course of liver treatment showed an increase in the number of red cells, while the one case in which this response was lacking showed no such increase, appears to indicate that any extensive rise in the blood count must be preceded by the appearance in increased numbers of these young red cells, and that unless a reticulocyte response occurs an increase in the total number of red cells is not to be expected. Case 5 illustrates the necessity of making a distinction between improvement in anæmia due to increase in the hæmoglobin percentage, to increase of the total number of red cells, and to both.

It is probably significant that the four cases which showed both a reticulocyte response and an improvement in the blood picture were all suffering from shortage of red cells resulting from old or recent hæmorrhage. A large hæmorrhage is usually followed by speedy blood regeneration, but in certain cases there appears to be a failure of blood restitution which, as in Case 3, may persist over a long period. In these cases of failure of blood regeneration after hæmorrhage, liver, particularly in combination with iron, appears to have great value.

Conclusions.

1. In certain cases of secondary anæmia liver therapy is effective in causing a reticulocyte response and in raising the blood count.

2. The best results are to be looked for in those cases of secondary anæmia due to failure of blood regeneration after hæmorrhage.

3. The effect of the liver therapy is greatly enhanced by the simultaneous exhibition of iron.

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Clinical and Laboratory Notes.

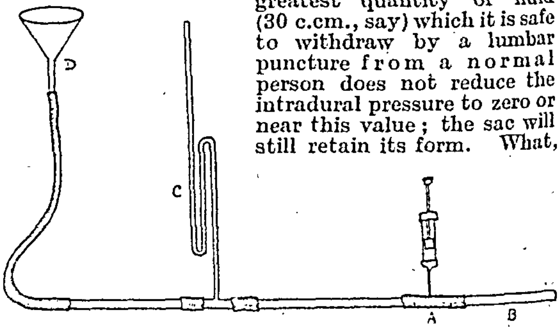
A NOTE ON SPINAL ANÆSTHESIA.

By CHARLES A. PANNETT, B.Sc., M.D. Lond., F.R.C.S. Eng.,
PROFESSOR OF SURGERY IN THE UNIVERSITY OF LONDON; SURGEON TO ST. MARY'S HOSPITAL.

A FEW months ago some observations on the use of a heavy solution of novocaine for the production of spinal anæsthesia were published in THE LANCET.[1] The paper provoked some discussion on the manner of spread of an anæsthetic agent in the spinal canal. That precise knowledge of this subject does not exist was the one certain fact which emerged. It supplied the stimulus for a further study of the phenomenon. The result has been the development of a very simple technique for spinal anæsthesia, which as far as can be judged from a small experience, is an unusually reliable method of ensuring the spread of the anæsthesia to a segment high enough to permit of operations in the upper abdomen.

Physics of the Dural Sac.

The dural sac is composed of inextensible white fibrous tissue. A sac removed post mortem was found to accommodate 30 c.cm. of liquid from the level of the fourth cervical segment to the lower end. The appearance of the flaccid dural sac when exposed by dissection of the dead body is, however, not a true picture of what exists in life. For the subarachnoid pressure varies between 12 and 20 mm. Hg, whereas the pressure between the dura and bony wall of the spinal canal is of the order of –1 to –18 mm. Hg.[2] The inevitable result is that the dural sac always assumes its maximal capacity. In other words, its transverse section is always a circle and it is incapable by any deformation of increasing its internal volume. It might from this point of view have rigid walls; it would act no more impassively in the withdrawal or injection of fluid. For the greatest quantity of fluid (30 c.cm., say) which it is safe to withdraw by a lumbar puncture from a normal person does not reduce the intradural pressure to zero or near this value; the sac will still retain its form. What, then, takes the place of the evacuated fluid? It is taken by an increase in the size of the numerous thin-walled vessels which lie within the spinal and cranial cavities. But here it is to be noted that the large vessels in the spinal canal are confined to the region of the cord. They are not present below in the region of the cauda equina. Suppose, then, a definite volume of liquid be injected into the spinal dural sac at the level of the second lumbar interspace. As it is slowly injected it is likely to find its path blocked in the caudal direction because the sac is distended to its fullest capacity, and there are not here present thin-walled vessels which can diminish in size to make room for the introduced fluid. It will have to travel cranialwards.



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[1] Pannett, C. A.: Hunterian Lecture on Local Anæsthesia in Upper Abdominal Surgery, Feb. 9th, p. 271.

[2] Heldt, T. J., and Moloney, J. C.: Amer. Jour. Med. Sci., 1928, clxxv., 371.

How far up it will reach will depend upon its volume. That such is the distribution of an injected fluid under the conditions assumed is proved by a simple experiment with the apparatus shown in the Figure.

The blind end B represents the closed lower end of the dural sac; the open funnel D acts as the compressible vessels in the brain and cord; the manometer C registers the pressure. A coloured dye injected at A through the rubber tube is seen to flow only towards D and to spread scarcely for any distance at all towards B. If it is of greater specific gravity than the contained fluid it will soon settle down to the lower half of the tube, and then its movement will be dependent upon the slope of the whole apparatus.

Conditions in Life.

Are the conditions in life comparable with those of such an experiment? Obviously, if there is an active circulation of cerebro-spinal fluid a disturbing factor will be at once introduced. The statement[3] that cerebro-spinal fluid secreted within the skull passes down the posterior part of the spinal canal behind the cord and returns upwards along its anterior surface is not warranted by experimental facts. It seems certain that absorption does occur through the endoneural lymph spaces of Retzius, but the whole circulation is a very sluggish one when the dura is intact. In the rabbit, under urethane anæsthesia a dye injected under the dura has scarcely spread at all after the lapse of one hour. It is true that Weed[4] states that potassium ferrocyanide and iron ammonium citrate injected into the lumbar sac travelled up the whole spinal sac and filled it and the basilar spaces very speedily, but a perusal of his records reveals the fact that in all his experiments the injected fluid was at a considerably higher pressure than the cerebro-spinal pressure of the animals used. Naturally, under these circumstances the large vessels in the spinal canal and cranial cavity contracted to allow the new fluid room. All he really did was to push the cerebro-spinal fluid out of the canal into the cranial cavity, the very phenomenon which our above-mentioned experiment with the apparatus demonstrated to be possible.

A further argument has been adduced to prove that fluid passes upwards from the spinal canal to the brain. When a spinal cord tumour blocks completely the dural sac it is found that the composition of the fluid below is different (appearance of protein for one thing) from that of the fluid above, and it is said that this is due to the accumulation of the products of metabolism which now have their upward path of escape shut to them. But there is a much better explanation. Below the block the mechanism of absorption from around the nerve roots remains intact; it still goes on, whereas renewal from the choroid plexuses above is prevented. The space formerly occupied by the absorbed fluid would now seem to be taken by an exudation from the blood-vessels. Hence the change of composition. Based upon such reasoning the following technique of high spinal anæsthesia was devised.

The Technique of High Spinal Anæsthesia.

A preliminary injection of morphine (to allay anxiety) and atropine (to inhibit the vagus since it works unopposed as the cardio-accelerator nerves are blocked) is given. The patient is made to curl up lying on his left side. The space between the second and third lumbar spines is then anæsthetised with 1 per cent. novocaine and the spinal anæsthetic needle, which is 7·5 cm. long and only 0·8 mm. in diameter, is introduced into the dural sac. Eight cubic centimetres of cerebro-spinal fluid are slowly withdrawn into a 10 c.cm. syringe which is detached and the needle in situ occluded with its own obturator. Through the nozzle of the syringe 1 c.cm. of 15 per cent. novocaine in distilled water is introduced into the 8 c.cm. cerebro-spinal fluid, space having been made by further withdrawal of the piston. The novocaine is drawn into a 1 c.cm. syringe provided with a hypodermic needle to enable this to be done. The hypodermic needle is then fixed to the large syringe to allow it to be turned up and down to ensure proper mixing. All air is expelled, the hypodermic needle detached, and the syringe fitted to the lumbar needle whose stylet is removed. The 9 c.cm. of liquid containing the dose of novocaine is slowly injected, the patient turned on to his back, and the head end of the table sloped downwards 5° or 10° since the specific gravity of the injected fluid is necessarily raised somewhat. This volume of fluid will reach up to and bathe the third or fourth dorsal nerves. The concentration of novocaine in it is about 1·66 per cent.—i.e., sufficiently strong to soak into nerve trunks. It should never be forgotten that the power of penetration into nerve tissue is a function of the concentration of novocaine. If it is too low no anæsthesia will be obtained. When the patient is turned over 50 mg. ephedrine are injected hypodermically. In ten minutes' time the surgeon may begin his work, but he must get done what he wants to do in one hour. This is the only drawback to spinal anæsthesia. It is usual in any operation done under local anæsthesia with novocaine to find sensation returning in an hour. It is not peculiar to the spinal method. A drug which will produce prolonged anæsthesia is much wanted.

This preliminary note is published because the method so simple has proved so extremely satisfactory and does appear to be based upon sound physiological and mechanical principles. The method described should, however, be meticulously followed.

A "PERMANENT WAVER'S" CRAMP.

By G. Arbour Stephens, M.D., B.Sc. Lond.,
CONSULTING CARDIOLOGIST, KING EDWARD VII. MEMORIAL HOSPITAL.

A YOUNG woman, aged 21, after four years' strenuous employment as a "permanent waver," was compelled to give up work on account of severe pain in the right wrist.

On examination it was found that she was suffering from teno-synovitis over the lower part of the right forearm.

She complained of nothing else; her appearance was quite healthy and she said her appetite was very good. On further examination it was found that there was a marked hypersensitiveness over the areas shaded in the figures corresponding to the parts supplied by the fifth, sixth, and seventh cervical nerves and by the second to the eighth dorsal nerves on the right side of the body.

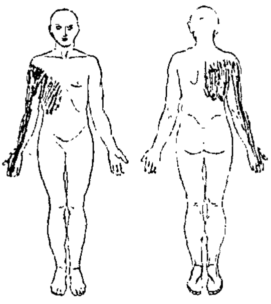

Diagram showing the hypersensitive areas.

The work of a "permanent waver" is very strenuous as it means standing for several hours every week, oftentimes in awkward positions in a badly ventilated room. In order to produce a satisfactory æsthetic effect, a considerable amount of tension needs to be applied, and it is in the application of this tension that the strain is placed upon the muscles of the right forearm. The patient is a well-built young woman who gets her exercise by rowing, but owing to a very serious accident to a member of the family there is no doubt that the tone of her general nervous system has been disturbed.

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[3] Jackson, H.: Jour. Amer. Med. Assoc., 1922, lxxix., 1394; Levinson, A.: The Cerebro-Spinal Fluid, London, 1923.

[4] Weed, L. H.: Physiol. Reviews, 1922, ii., 171.

A CASE OF NEPHRITIS.

BY E. WORDLEY, M.D. CAMB., M.R.C.P. LOND.,
PATHOLOGIST TO THE SOUTH DEVON AND EAST CORNWALL HOSPITAL, PLYMOUTH.

THE following case of nephritis is described in some detail because I believe that it presents some unusual features. It is a case of chronic azotæmic nephritis of quite sudden onset in a young adult.

Family history.—Father died of uræmia, aged 58, in December, 1927. Mother alive and healthy; one brother, aged 36, in good health.

Past history.—Had scarlet fever when 5 years old, no other illnesses. Patient had worked as a painter since he was 14. For the past year he had worked in Devonport Dockyard at heavy manual work and could do anything a normal man could do without any headache, fatigue, or shortness of breath.

History of present illness.—Was in perfect health until about the time of his father's death in December, 1927. This appeared to upset him. About January, 1928, he first noted some impairment of health. He used to get dizzy while at work and was easily tired and rather short of breath. He continued at full work until the beginning of June, 1928, though with increasing difficulty. He consulted his doctor at this time on account of the dizziness and palpitation. Albumin was noted in the urine, but no other physical signs. Some blood was taken for urea estimation, when the surprising figure of 443 mg. per cent. was obtained. He was forthwith admitted to hospital, and by the kindness of Dr. A. B. Soltau he was admitted under me for further investigation.

Condition on admission.—On admission, July 8th, 1928, he complained of very little; the palpitation for which he had previously consulted his doctor had passed off, and except for a feeling of lassitude and an unpleasant metallic taste in the mouth, said he felt fairly well. He was a bright-complexioned man and did not look anæmic. The cardiac impulse was in the nipple line. The heart sounds were normal in character. The blood pressure was 128/90 mm. Hg. No œdema was present. No abnormal physical signs in respiratory system or abdomen or central nervous system. Teeth good, no blue line. Urine: specific gravity, 1010; reaction acid; albumin, 0·1 per cent.; no casts or cells present.

Date.	Blood-urea.	Uric acid.	Creatinine.	Plasma phosphates.	(*a*) Calcium. (*b*) Cholesterol. (*c*) Blood-sugar.	Blood pressure.	Red cells (millions).	Hb.	Remarks.
1928.									
2/7	443	—	—	—	—	135/90	—	—	U.-c.t. 1. 1·2
4/7	425	—	—	—	—	—	—	—	—
9/7	330	—	—	—	(*c*) 0·131	—	2,400	38	On admis.
11/7	490	—	—	—	—	—	—	—	—
18/7	350	—	—	10·3	(*a*) 9·84 (*c*) 0·312	—	—	—	—
25/7	212	7·8	4·9	10·6	(*c*) 0·181	—	2,200	39	P.p. 4 %
7/8	241	6·2	6·9	8·7	—	—	2,600	36	U.-c.t. 0·7 0·8 P.p. 3·9
15/8	210	6·6	4·6	7·7	—	124	1,800	32	P.p. 4·5
22/8	232	7·2	4·6	6·4	—	138/90	—	—	—
29/8	240	6·9	4·8	7·6	(*a*) 9·4 (*b*) 23·6	132/90	1,800	32	—
4/9	212	7·6	7·5	8·3	—	—	1,900	33	—
12/9	188	4·4	6·6	6·1	(*b*) 0·241	128	—	—	—
24/10	195	5	5	—	—	125	3,500	55	P.c. 420
19/11	228	7·36	12·7	6·8	—	120	—	—	—
17/12	298	9·6	11·8	—	—	140	3,100	44	—
1929·									
18/1	352	6·8	13·6	7·6	—	—	—	—	Readmitted.
31/1	430	6·4	16	10·5	—	—	—	—	P.p. 5·1.
8/2	670	10·5	24·4	19·5	(*a*) 9·3 (*c*) 0·281	—	—	—	—

U.-c.t. = Urea-concentration test.
P.p. = Plasma protein. P.c. = Plasma chlorides.

Mr. J. R. Rolston reported that the fundus generally was myopic in character; otherwise no pathological features were present.

Course of illness.—The patient remained in hospital from July, 8th, 1928, to Sept. 15th, 1928. After the first fortnight he appeared to be in very fair health; he was up most of the day helping in the work of the ward and was quite active and energetic. He was at once put on a diet containing as little protein as possible, and it will be seen in the Table. detailing the various clinical and biochemical findings that the blood-urea fell somewhat. The metallic taste in the mouth vanished. He passed three pints of urine daily containing 0·1 per cent. of albumin. The specific gravity was constant at 1010. The systolic blood pressure on discharge was 128 mm. Hg and the Wassermann reaction was negative.

Repeated blood counts gave about 3,200,000 red cells and 45 per cent. of hæmoglobin. Stained films showed no evidence of stippling of red cells. In view of the fact that he had worked for many years in a paint shop the urine was examined carefully for lead by Aub's micro-chemical method [1] in which lead is crystallised out as a hexanitrite of potassium lead and copper. This test was negative. Since Hunter and Aub [2] have shown that lead is rapidly eliminated after giving parathyroid, the above test was repeated after giving this gland, but the results were again negative. Andrews's diazo test [3] was strongly positive. The urea-concentration test on admission gave figures 1·2, 1·2, 1·3.

He remained at home until Jan. 15th, 1929, when he was readmitted to hospital. During this time, until just after Christmas, he was in very fair health, his appetite was good, and he used to take long walks every day, and talk about going back to work. He had been promised a light job and felt quite equal to doing this. He used to attend every fortnight for examination and blood was usually taken at these visits. His mother said that at Christmas time he had been up and about most of the day while shopping and apparently was not at all fatigued. Having attended on Jan. 15th, 1929, he complained of feeling rather tired and of having an unpleasant taste in the mouth. His blood-urea was found to be 352 mg. and he was forthwith readmitted. His condition on examination was similar to that already described on his first admission. His colour was good, he was well nourished, and he himself did not think that he was particularly ill. Blood pressure was 143/93, no œdema was present anywhere. He was able to get about, and helped in the ward work in the afternoons. On Jan. 31st he began to complain of severe headache and nausea, and also of the still present unpleasant taste in the mouth. Blood pressure 135/82. Blood-urea 430 mg. per cent. He felt depressed and was rather drowsy. No œdema was present.

On Feb. 5th he felt very ill and started vomiting everything he took. He had severe headache; the blood pressure was 133/75, and there was no œdema. On Feb. 6th he was drowsy and constantly vomiting. Blood pressure 130/75. On Feb. 8th he was very drowsy and had severe headache. The blood-urea was 670 mg. per cent. and the blood pressure 100/55. There was still no œdema. He died suddenly on Feb. 9th.

Autopsy.—With difficulty permission was obtained for a post-mortem examination limited to the removal of the kidneys.

The body was well nourished; no œdema was present anywhere. On incision of the abdominal wall, the subcutaneous fat was not diminished. No free fluid was present in the peritoneal cavity. The kidneys were small and several small cysts were scattered over the external surface. They were pale in colour. The capsule was adherent and on stripping it a raised rough papilliform surface was left. The right kidney weighed 60 g., the left 55 g. The cortex was 4·5 mm. in depth and well demarcated. The cut surface was a pinkish yellow colour and finely mottled. The medulla was paler and almost of a yellowish colour. The peripelvic fat was increased.

Microscopical examination of the kidneys showed them to be completely disorganised. Extremely few approximately normal glomeruli or tubules were present. Nearly all the glomeruli were completely fibrosed and embedded in fibrous tissue, and the substance of the kidney mainly consisted of fibrous tissue infiltrated uniformly with small round cells. Most of the few tubules present were filled with colloid material, the epithelium flattened or defective. All the smaller vessels showed marked thickening of the intima.

Discussion.

Clinically the outstanding feature of this case is the very short and indefinite story of ill-health, at the most a vague feeling of malaise for three or four months, before on examination it was noted that his blood-urea was over 400 mg. per cent. And on examination, beyond a cloud of albumin in the urine, nothing abnormal whatever was found; the man was of a good colour in spite of the low red cells and hæmoglobin, and was well nourished and generally felt in very fair health. The blood pressure was very little raised. MacLean[4] has recently described cases of this nature.

Another curious feature of the case was the complete absence of œdema throughout the whole time he was under observation. As a result of a low protein intake the blood-urea fell considerably from 400 to 200 or just below and the patient was in very fair health and able to take long walks. It will be seen from the Table that the serum calcium did not fall very low, nor the plasma phosphates rise very high in relation to the very high urea figures; indeed, the calcium throughout was practically normal, in marked contrast to cases reported by de Wesselow[5] and Izod Bennett.[6] The peculiar metallic salty taste in the mouth described by Bennett was at times very troublesome to this patient but was only noted when the blood-urea was over about 300 mg. per cent. As happens so often in this type of case the symptoms of uræmia came on with great suddenness.

The case is interesting because it shows the great value of a thorough chemical examination in some cases of nephritis. It is, I think, certain that on a clinical examination alone in the early stages of the disease no one would have realised how hopeless the condition was. Further, I think no class of disease would repay better than nephritis a long-continued clinical study over many years, undertaken by practitioners who could observe and describe the whole course of the disease with the care that was so successfully employed by the late Sir James Mackenzie in diseases of the heart.

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6. Bennett, T. Izod: THE LANCET, 1928, i., 535.

Reviews and Notices of Books.

RECENT ADVANCES IN PSYCHIATRY.

By H. DEVINE, M.D., B.S., F.R.C.P. Lond., Medical Superintendent, Holloway Sanatorium, Virginia Water. London: J. and A. Churchill. 1929. Pp. 340. 12*s.* 6*d.*

THE central theme of this well-written book consists of an exposition of a particular philosophical conception of the nature of mental disorder. A number of the principal modern tendencies in psychiatric research are summarised, and their supposed implications ingeniously dovetailed into the philosophical scheme. The latter consists fundamentally in a conception of the organism as a whole, with an indissoluble relation to its environment. To contemplate the organism and its functions, apart from environment, is, according to Dr. Devine, a philosophical and methodological absurdity; functions have to be defined in terms of environmental stimuli and organic responses. This bipartite conception has no need for a dualism of body and mind. Mental disorders are really "organic" disorders, the result of more or less durable disharmonies between the organic cravings and the environmental conditions.

This particular application of the main conception colours completely the scientific outlook of the book. Following an introductory chapter on the fundamentals of psychiatry, in which the conception of mnemic causation is adopted, there is a discussion on toxic-infectious and similar factors in the causation of the psychoses. Much of the emphasis of this section is laid upon showing that a confusional syndrome can arise on a basis of physical or emotional perturbation alike. This is, of course, generally known; here it is made to contribute ingeniously to the main thesis—that there is an organic basis of all or most mental illness. But in his eagerness to make this point, the author is in danger of obscuring one of the cardinal rules of clinical psychiatry—namely, wherever confusion exists, to suspect the presence of a recognisably physical component in the ætiology. Confusion explicable in purely psychological terms seems hardly to be considered. The importance of the isolation of the confusional syndrome by Meynert is stressed; but the opportunity is lost of pointing a moral—much needed at the present day in psychiatric circles in this country—namely, the possibility of clear determination, by means of clinical mental characteristics alone, of a mental reaction found principally in association with discoverable organic disease. Wider recognition of the significance of this clinical type would prevent certain errors in therapeutic claims. This touches upon an important point in the author's conceptions. For him a psychosis is an "organic" disease; but the meaning of this statement to him is that a psychosis is "the interpretation in the psychic life of endogenous excitants or disturbances originating in the depths of the organic life." The fact that this is not the usual meaning of "organic" disease is nowhere made explicit. Yet surely organic disturbance of the kind may be "functional" nevertheless. It would seem helpful if instead of the distinction between "functional" and organic, the essential delimitation were between reversible and irreversible. Organic and structural are not synonymous; organic, in Dr. Devine's sense, may be "functional"; and functional may or may not be psychological.

The contributions to the psychopathology of the psychoses made by C. G. Jung, J. T. MacCurdy, and A. Storch are dismissed in less than a paragraph each. The stratification of the psyche itself is not mentioned, which may be partly the result of the omission of any detailed consideration of these writers; and it helps to explain the impression one obtains from the book of a psychiatrist standing helpless in face of the—to him—incomprehensible psychological farrago presented by his patients and their utterances. Sullivan's recent work on the mental experiences of schizophrenics is not mentioned at all. There is another curious omission—curious because it would perhaps have supported the author's thesis of an organic basis for the psychoses; the recent work on mescal in normals and in psychotics is not alluded to. A useful emphasis is laid on hereditary studies, while at the same time the author deprecates putting too much weight on the heredity of any particular case. Rudin, the principal present-day explorer in this field, does not receive the honourable mention which is his due; nor in a discussion on the inheritance of acquired characters do W. McDougall's experiments on white rats find a place, although if valid they are more precisely relevant than those discussed in the text. H. A. Cotton's work on focal infection in the psychoses is quoted largely, and cautiously approved in principle. The facts that no one else has ever approached the results claimed by Cotton, and that the latter has for some years substituted colonic wash-outs for catastrophic colectomies are not explicitly mentioned.

There is an attractive chapter on the effect of somatic disease in psychotic subjects; but we cannot help thinking that from the physiological point of view the French theory of colloidoclasia as applied to the psychoses, by which an emotional shock is supposed to sensitise the organism in a way strictly homologous with anaphylactic sensitisation, is as airy a speculation as any of which the lesser Freudians have ever been accused.

Part III., "the behaviour of the organism in mental disorders," is an interesting attempt to fit a number of discrete physiological observations into the author's general thesis; and the attempt furnishes a useful object-lesson. It shows well how experimental results and data of laboratory observation—in this case those of F. Golla and his co-workers at the Maudsley Hospital—may be endowed with a significance of which the original observers did not dream, and which will probably surprise them. Moreover, A. A. Osman has recently described similar acid-base changes in the blood in a random group of debilitated children. The chapter on the basal metabolism in the psychoses is difficult to follow on account of the varying notation employed.

The ingenious elaboration of the conception of hysteria as a mythomania is attractive; but like so much of the French inspiration of this work, its attractiveness is seductive. It would be a pity if hysterics in general were regarded as "mythomanic"; there are a great many different types of personality in whom hysterical symptoms can appear; and simple generalising alignment (after Jung) of hysteria with "extroversion" will not do. The Freudians are repeatedly asked to supply statistical evidence of their views; but Kreschmer's type-characterology is less critically accepted. It would have been interesting to have had the personal observations of an experienced psychiatrist like Dr. Devine on the relationship of manic episodes, for example, to the "asthenic habitus." In the chapter on treatment no reference is made to Pearce Clark's claim to treat psychotic depressives successfully with a modified psychoanalytic technique; while Meyer's classical article on the treatment of paranoia and paranoid states is not mentioned. No reference is given to the recent increasing interest in children and in their "nervousness"; and the statement that the general intelligence is unaffected "after epidemic encephalitis" takes no notice of the best work so far done on this topic—namely, that of S. Dawson and Conn, who claimed that a fairly persistent retardation commonly occurs. Perhaps the least forgivable, because most fantastic, flight of Dr. Devine's physiological fancy occurs when he speaks of overstrain of the neurones leading to their degeneration and so to dementia, e.g., to dementia præcox; but so preoccupied is the author with the "organic" substance of everything mental that when towards the end he admits "pure psychogenesis"—sometimes—it is with an air of surprise. The book is preponderantly French in inspiration; references to German literature are disproportionately few.

We have considered it worth while criticising this book at length, partly because the series to which it belongs has had such deserved success, and partly because the present work is so well constructed, and welds into such a compact whole so many diverse facts. It is bound to have an effect in forming the opinion of the young psychiatrists in this country; but the emphasis on the organic basis (in Dr. Devine's special sense) of mental disorders leads to a comparative neglect of what most people regard as important recent contributions and therefore to a somewhat one-sided presentation of recent psychiatric work.

THE PSYCHOLOGY OF PHILOSOPHERS.

By ALEXANDER HERZBERG. London: Kegan Paul, Trench, Trübner and Co., Ltd.; New York: Harcourt, Brace and Co. 1929. Pp. 228. 10*s.* 6*d.*

IN this, the latest addition to the International Library of Psychology, Philosophy, and Scientific Method, Dr. Alexander Herzberg does justice to his inclusive theme. Musing in his preface on how a particular neurosis comes to be developed with its associated symptoms, he inquires what kind of person it is that develops a neurosis, and what kind it is that does not; and then, by analogy, he asks how any individual arrives at a particular theory of life, and what the make-up must be in order to work out any theory at all, seeing that the majority of the world undergo no such process. The purpose of the book is to answer the last of these questions—namely, what sort of man formulates a constructive outlook upon life for himself; and he enumerates the factors which he holds must be present to the subject's mind in order that he may become a constructive thinker.

Discussing what constitutes philosophy, he compares the modern and the ancient position, when philosophy was an undifferentiated whole, comprising religion, poetry, and science. To-day, under the pressure of practical requirements, we perceive independent divisions of thought — mathematics, astronomy, physics, chemistry, and biology, for example, all yielding to this process of differentiation, leaving psychology, logic, and ethics to comprise philosophy. Dr. Herzberg makes it clear that he does not consider this whittling process to be justified, and he doubts if it has occurred, putting forward here a definition that philosophy is the science of the widest problems in all fields, and of those problems which affect mankind most closely. Following a justification of the argument that philosophy should be regarded as a homogeneous science, he inquires into the nature and objects of philosophic interest and the characteristics of philosophic thought, and then in a series of essays discusses the professional lives of some of the best known philosophers—Socrates, Plato, Aristotle, Epicurus, St. Augustine, Bacon, Hobbes, Descartes, Locke, Leibniz, Berkeley, and a score of more modern exponents. He finds that 27 out of 30 of the great philosophers display in the matter of choosing a profession conspicuous divergencies from the normal, and, curiously enough, many of them have shown either hesitation in embarking upon any career at all, or inefficiency when they have embarked upon it—or both. Many seem to have had no business-like sense of the value of money, many showed conspicuous peculiarities in relation to love, marriage, social intercourse, active politics, or the whole practical side of life, but all of them have been men of great intensity of impulse, and more than normally intense inhibitions.

The biological value of philosophy the author finds is threefold, serving as a substitute for practical action in the discharge of excess impulse energies, creating in the place of harsh and intractable and therefore unsatisfying reality, a painless and tractable world, and leading by means of a detour, to the real satisfaction of powerful interests.

PROCTOLOGY.

By FRANK C. YEOMANS, A.B., M.D., F.A.C.S., Professor of Proctology, New York Polyclinic Medical School. London and New York: D. Appleton and Co. 1929. Pp. 661. 45*s.*

THIS text-book is a magnificent production which will take its place as one of the leading books in the English language on diseases of the rectum and pelvic colon. The author clearly writes with a vast personal knowledge of the subject and of its literature. Old and well-proved methods are given their due position, and at the same time the newer methods are described in detail, with the author's opinion of their value. Of some of recent and much-vaunted remedies he speaks with caution and scepticism. E. P. Clemons's method of treating rectal strictures with CO_2 snow is described, and J. A. Bargen's researches on the diplococcus which he has found in ulcerative colitis; Dr. Yeomans modestly notes his own recent work on the treatment of pruritis ani by the subcutaneous injection of benacol—a new anæsthetic solution in oil. The chapter on diverticulitis is an excellent summary of what is at present known of this interesting condition; attention is drawn to the dangers of infection following resection and end-to-end anastomosis; Dr. Yeomans considers that if resection is possible it should be done in stages by the Mikulicz method. In discussing the question of excision of the rectum for cancer, the author points out that the surgeon must be familiar with the different methods available and must fit the operation to the individual case; an interesting table is given of results of excision of the rectum according to different authorities. A general discussion of the indications and results of radium therapy for carcinoma of the rectum is given, and some description of treatment by radon seeds and radium packs. The modern technique of the "surgery of access" and radium-needle barrage as described by Neumann and Coryn is not mentioned.

In this excellent treatise the subject matter is clear, accurate, and sensible; the references at the end of each chapter are complete and up to date; the print is clear and the illustrations are numerous and excellent. In fact, the book is one which every surgeon and practitioner interested in proctology will read for pleasure and study with profit.

THE FACTS OF MODERN MEDICINE.

By FRANCIS W. PALFREY, M.D., Instructor in Medicine and in Hygiene, Harvard University. London and New York: D. Appleton and Co. 1929. Pp. 190. 21*s.*

Dr. Palfrey has written a useful book. He defines his own work as a simplified statement of established knowledge on medical subjects, which implies the clearing up of certain current misconceptions; the purpose is to place the basic facts of medical knowledge before the educated public that their comprehension may lead to a better mutual understanding between such a public and the medical profession. So we have here an intention to supply a scientific, though popular, book to take the place of those terrible "family medical advisers" published in response to the desire of patients to treat themselves without consulting the doctor. Aware of the criticism to which the book will be subjected—criticism which invariably takes the form of quoting Pope—on the ground that the attempt to be scientific must fail where an unequipped audience is addressed, Dr. Palfrey replies that the growing recognition of the fact that the public should have more opportunity of learning the truths of medicine justifies his work, and we think that he is right. For, as the author says, "the dangers of popular attention to medical subjects do not lie in an understanding of facts by those capable of assimilating them: they lie rather in erroneous impressions derived from partial or imperfect understanding of facts." With a view to an explanation of these facts we have some 200 pages forming a summary of the fundamental sciences, and 250 pages containing a categoric though necessarily brief description of various diseases. The first part of the work is decidedly well done. The notes on elementary biology are clear; the essentials of anatomy and physiology are given carefully; and in a sense the instruction is simple, but whether it will be simple for those who have not already mastered the sciences in a more detailed manner we considerably doubt. Concerning the second part of the book, which is the reason for its writing, it depends entirely upon the way that the information is used whether it proves of value or no to the lay reader. He who thinks that perusal of these able summaries will free him of worry, rooted in imperfect knowledge, will be disappointed, unless he obtains a perilous amount of self-confidence; but he who reads with the desire to ascertain medical views along a particular line, as they are expressed, will be a far more alert disciple of the truth.

THE SCHICK TEST.

A Practical Guide to the Schick Test and Diphtheria and Scarlet Fever Immunisation. By GUY BOUSFIELD, M.B., B.S. Lond., Medical Officer, Diphtheria Immunisation Clinics of Camberwell and Lambeth; Bacteriologist, Camberwell and Hackney. London: J. and A. Churchill. 1929. Pp. 72. 5*s.*

THIS small book, written for those beginning or already engaged in active immunisation against diphtheria and scarlet fever, covers the ground fairly well, though references to the copious literature are rather scanty. Most of the text relates to diphtheria and to English practice. After a short discussion of the fallacies of swab diagnosis, the technique of the Schick test, and the way to read results, active immunisation and the various problems arising at the initiation of a clinic are described. In the control of epidemics Dr. Bousfield suggests that the main reliance should be placed upon Schick testing, with swabbing as a necessary adjunct. In his hands double immunisation against diphtheria and scarlet fever has not been satisfactory. He does not discuss fully the difficulty of a decision when an indefinite small reaction appears in retesting after immunisation. The five-minute interval recommended between desensitising doses of serum is too short, for a reaction after a small test dose in a sensitive patient may not appear for an hour. The illustration of a "positive and pseudo" reaction is not very clear.

The book contains some useful hints on minor points; the discarding of a white overall and a timely gift of sweets may often avert unwelcome tears at an inoculation clinic. Most of the information required by the novice as well as the more experienced worker is supplied in handy form, and public health administrators and many practitioners will be well advised to place this book on their shelves.

LIGHT AND HEAT IN THERAPY.

With a Chapter on Foam Treatment. London: The Actinic Press. 1929. Pp. 174. 6*s.* 6*d.*

THE Proceedings of the Second International Conference on Heat and Light in Medicine and Surgery, held in London in October–November, 1928, have been published in book form. It contains contributions on heat and light treatment in nervous affections, gynæcology, surgical and pulmonary tuberculosis, and in diseases of the ear, nose, and throat, as well as on technique and apparatus, and a brief report of the discussion which took place on each subject.

THE KAHN TEST.

A Practical Guide. By R. L. KAHN, M.S., Sc.D. London: Baillière, Tindall and Cox. 1928. Pp. 201. 18*s.*

THE considered opinion of the League of Nations Serological Congress at Copenhagen (1928) served to confirm the generally accepted view that the Kahn test for the sero-diagnosis of syphilis is the most reliable of the numerous precipitation reactions. Prof. Kahn's latest book is an elaboration of the section on Procedure of his "Serum Diagnosis of Syphilis by Precipitation," published in 1925, and is designed to be a companion to two other volumes as yet unpublished. One half of the book is devoted to the standardisation of every aspect of the three variables used in the test, with the object of producing optimum sensitivity and eliminating false positives, whilst the technical description of methods is elaborated with a valuable discussion on the rationale and theory of precipitation reactions. The procedure of the test proper, both quantitative and qualitative, with blood-serum and cerebro-spinal fluid includes also recommendations for glassware and apparatus and a description of a micro-technique. Medical men as a whole will welcome any sero-diagnostic test for syphilis which can be rendered sensitive enough to detect latent disease during the course of treatment; in this respect, the especially sensitive antigen of Kahn for use in the "presumptive procedure" for treated cases of syphilis indicates an advance not yet achieved in the technique of the Wassermann reaction.

The book, which has a good bibliography, is essential to any worker performing the test, and is of value to those interested in the practice and theory of precipitation reactions.

A History of Pathology.

By E. R. Long, Professor of Pathology, University of Chicago. London: Baillière, Tindall and Cox. 1928. Pp. 291. With 45 plates. 22*s.* 6*d.*

Prof. Long has attempted what no one has done before, and he has succeeded quite well. Pathology is slowly settling down to be itself, and, if it has not yet quite made up its mind what it is after, it has achieved a special place in the academic world, a literature and a priesthood. The present is the fulfilment of the past and the promise of the future, and pathologists might well spend a little time reflecting where they are and how they got there, in the light of what Prof. Long has to tell them. Rather too large a proportion of the book is given to the ancients; the tale hardly becomes of much moment before the nineteenth century.

Jahresbericht Radiologie.

Compiled by K. Frik. Vol. I. Berlin: Julius Springer. 1929. Pp. 388. R.M.38·80.

This is a most complete bibliography of recent radiological literature, exceedingly well classified as regards subject matter, and with adequate cross references. That the volume contains approximately 7000 references is some index to the extent of the work that is being done in radiology as applied to medicine. This painstaking compilation appears to be exhaustive and accurate; we note, however, that a defect is the omission in most instances of the year of publication, although the volume and page are given. We trust that in future editions the author will include this information, which shows at a glance which communications are likely to be useful for any special purpose and which are likely to be out of date.

Sexual Life of Savages in North-Western Melanesia.

By Bronislaw Malinowski, Ph.D., D.Sc., Professor of Anthropology in the University of London. With a Preface by Havelock Ellis. London: George Routledge and Sons. 1929. Pp. 506. 42*s.*

Dr. Malinowski's ethnological work is already well known, and in this book, which deals in detail with the natives of one small island group, he describes his methods and makes clear the mental attitude necessary to success in understanding savage customs. It is assumed that his readers accept the standpoint that an account of sexual life must be as free from limitations as the account of any other human activity. Setting aside any preference he may have for our own customs and taboos, he is able to enter into personal friendships with his subjects; thus he has obtained spontaneous confidences and intimate gossip, in contrast to what he describes as "the mechanical pumping of informants by the question and answer method at so many sticks of tobacco an hour." Without drawing any moral, he shows a close parallel between the mental processes of the Trobriand Islanders and our own. Their social rules are different from ours, but not their reactions to them. They show the same reticences that we do, the same lifting or intensification of conversational taboos to correspond with the social occasion, and they present to the outsider a rigid code the frequent violations of which are revealed only through intimate personal acquaintance. Spencer and Gillen have described Central Australian tribes whose members believed that sexual intercourse had no relation to conception, and the writer, finding the same belief among the Trobrianders, was unable to convince them of the physiological facts of paternity even in regard to the breeding of goats and pigs. Descent is of course matrilineal, but government is in the hands of chiefs whose influence is economic and dependent upon polygamy. Dr. Malinowski thinks that efforts to abolish that custom will lead to social disorganisation and the gradual extinction of the race. Another practice placed under a ban by reformers from without is that of sexual freedom among the young, which by a process of trial and error leads to marriages not lacking in loyalty or affection and generally permanent. Love-magic and sorcery play their part in courtship, but seem to serve the purpose of allowing personal inclinations to disguise themselves as the product of irresistible external forces.

The subject of the book involves the whole social organisation of the community, of which the author gives a vivid picture, that is made more lifelike by the many excellent full-page plates. His theoretical discussions are marked by a dislike for speculating as to past evolution or cultural history; he regards customs as fitting into the actual social scheme and finds in their fitness sufficient reason for their existence. He has so come to appreciate the native's cultural qualities that he sees in them no more food for speculation about origins than we may observe in our own. This may disappoint theorists, but in no way lessens the value of a most interesting book.

Percussion of the Chest.

By J. B. McDougall, M.D. Glasg., F.R.C.P. Edin., Medical Director British Legion Village, Preston Hall, Aylesford, Kent. London: H. K. Lewis and Co., Ltd. 1929. Pp. 143. 6*s.*

This little book will be read with pleasure by those interested in percussion and the production and variation of sound. After a brief historical sketch and a short chapter on the technique of thoracic percussion, a long chapter is devoted to the acoustic aspect. The author divides the sounds elicited by percussion into two groups, the musical and non-musical, and a full description is given of the various notes which may be obtained. The final chapter describes the variations in the percussion note in certain diseases of the chest and contains an interesting description of the reflex bands of dullness which have been described in cases of pulmonary tuberculosis. A useful bibliography is appended.

JOURNALS.

Revue Belge des Sciences Médicales.[1]—The first number of this new journal, which promises to be a valuable addition to medical literature, came out in January under the guidance of a distinguished editorial board, including clinicians, pharmacologists, and pathologists. Appearing in ten numbers per annum it is intended for the publication both of original papers and of reviews on special subjects, together with abstracts of papers of the Belgian medical literature and a critical bibliography. The contents of the February number may be briefly summarised as an indication of the scope of the journal. It contains a paper by Dr. von Goidsenhoven on the treatment of essential thrombopenia by ligature of the splenic artery to which more detailed reference was made on p. 1159 of our last issue. This is followed by an "annual review" by Dr. A. Dupont, entitled Dermatologie et Syphiligraphie, which is confined to a summary of papers published during 1928, so that the reader is kept abreast of the most recent international literature. The review of the Belgian medical literature is in this number represented by abstracts of papers dealing with pharmacological subjects. The number closes with signed reviews of recent books.

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[1] London: H. K. Lewis and Co., Ltd. 20*s.* per annum.

HE LANCET.

DON: SATURDAY, JUNE 8, 1929.

Y MORTALITY FROM TUBERCLE.

the least profitable duties of a tuberculosis that which concerns the examination of ." The most readily accessible contact is l child, whose mother is seldom averse from iose "proper examinations" which have urped the place of a bottle of medicine in esteem. The candidate himself is seldom to forgo the tedium of an afternoon's for the sake of a medical adventure which to be painless, and may be rewarded with nalted oil. The average mother may, there- lied upon to bring to the dispensary all the f school age she possesses. Infants inevitably y their only nurse, and what has been ho "procession of contacts," duly takes e result is highly gratifying to all concerned, the tuberculosis officer's imagination has ivated by the possibilities of paravertebral n, he is able to report that the "contacts" uffering from tuberculosis. Children suffer- lupus, *Pott's disease, or even cervical* lo not appear in the queue, for the least mother will already have sought treatment bvious manifestations of non-pulmonary is. As a social investigation, as an oppor- giving a little elementary instruction in the ygiene the expedition may have been rom any other point of view the examina- tacts as usually conducted is futile, for, enerally, *children of school age do not* pulmonary tuberculosis. At the more entres the examination may include the ys and graduated skin tests. The appli- hese methods may, indeed, enable the officer to determine whether a child has cted to a "primary infection" with it as evidence of this will only be obtained ee of immunity has been established it is the finding has much practical value. l "tuberculous seedling" is not the pre- he consumptive adolescent who from pressure of business is usually reluctant e dispensary as a contact.

rent in value is an investigation of the undertaken by the Lancashire group of officers, the result of which is given in a ort edited by Dr. LISSANT COX.[1] The investigation was to determine the fate ldren living in tuberculous households. ose the histories of nearly fifteen hundred r five years of age, living in homes in more adults suffering from tuberculosis resided, were compared with those of children of the same age and living under comparable conditions, but not subjected to the risk of tuberculous infection. The most significant finding was that the death-rate from non-pulmonary tuberculosis among the children exposed to the risk of infection by a sufferer from "open" tuberculosis was greatly in excess of the rate occurring among the controls. The death-rate among the contacts in the first twelve months of life was nine times greater than that of the controls, fourteen times greater in the second year, and nineteen times greater in the next three years. Two-thirds of this mortality was due to tuberculous meningitis. The importance of intimacy of contact as a factor in the transmission of the disease is shown *by a mortality-rate significantly greater among the* children whose mothers were tuberculous than among those exposed to infection from tuberculous fathers. It is interesting to note that the death-rate from *all causes* in the first year of life was less among the contacts than among the controls. Dr. COX suggests that this may be due to the supervision of tuberculous households by the medical and nursing staffs of local authorities. It is relevant to note that the *reduction of mortality attributed to the use of BCG* vaccine in France extends to causes of death other than tuberculosis.

Prof. A. CALMETTE has calculated that in France 24 per cent. of the children of tuberculous mothers died from tuberculosis in the first year of life. The corresponding figure for Lancashire children was estimated as 3·2 per cent. The Lancashire death-rate for "contact" infants is, in fact, less than that *claimed for French infants protected by BCG* vaccine. But though the death-rate from tuberculosis in infants in Lancashire compares very favourably with that recorded elsewhere, the fact remains that a needless sacrifice of child life continues. The experience of Papworth has shown that it is possible for the child population of a fair-sized village to live in more or less constant contact with parents suffering from open tuberculosis and yet to *remain free from any manifestations of disease.* Where social conditions are satisfactory and where there is a scrupulous observance of the laws of hygiene the child of tuberculous parents is in no danger. But conditions at Papworth are admittedly exceptional. Might not more be done to lessen the risk of infection in areas where home conditions are far from ideal? The simplest solution of the difficulty would be either to remove the source of infection *from the home by arranging for the permanent* segregation of the tuberculous, or to provide an alternative home for the contacts. *The latter system* appears to have worked well in France, but it has the grave disadvantage that the children of a tuberculous father are deprived of both their parents. Even where legislation permits of compulsory segregation of an infectious patient experience proves that it is seldom enforced. The number of hospital beds *available for the treatment of advanced pulmonary* tuberculosis is notoriously inadequate. Reluctance to enter a poor-law institution prevents many patients from accepting relief of this kind from the guardians, even in those areas where harmonious relations exist between the poor-law and the public health authority. The provisions of the Local Government Act, if applied with humanity and intelligence, should remove many of the present difficulties and should enable the medical officer of health to use his powers of compulsion for the protection of threatened child life without violence to his charitable instincts.

Young Children in Tuberculous Households. ancashire Group of Tuberculosis Officers to the ittee of the Joint Tuberculosis Council, 1929. ing and Co., Ltd.

OCULAR IMBALANCE.

The equilibrium of the extra-ocular muscles of the two eyes is a subject which it is necessary for all those engaged in the prescription of spectacles thoroughly to understand, and the recent discussion on the subject at the congress of the Ophthalmological Society, reported in our issue of April 20th, will, it is hoped, do something to further this understanding. The first essential is familiarity with the anatomy of the extra-ocular muscles and their actions on the axis of each eye separately, especially of the four muscles whose combined actions move the eye in the vertical meridian. The second essential is to understand the difference between concomitant defects in the movements of the two eyes dependent on peculiarities of innervation of the centres for convergence, divergence, &c., and paretic defects dependent on weakness of particular muscles. When a defect due to either of these causes is so great as to cause an obvious squint the patient does not attempt to overcome it, but either sees double or suppresses the image in the squinting eye. When, however, the defect is so slight that the patient is able to overcome it by an effort of attention, either it may cause no symptoms at all or the effort may be attended by such a nervous strain that it may be accompanied by various uncomfortable nervous symptoms, often including headache which, according to Dr. E. E. Maddox, is generally of the occipital variety. These cases in which there is want of balance between the corresponding muscles of the two eyes, not great enough to cause a squint, are termed heterophoria, and according to the direction in which the movement of one or the other eye is defective there are a number of varieties of this condition which have received special designations, such as eso-, exo-, hyper-, and cyclophoria. There is a further distinction between the paretic cases, in which the defect varies in degree according to the direction in which the eyes are placed when the test is made, and concomitant cases in which the defect is equal in degree in whatever position the eyes are tested. Dr. Maddox, whose rod-test is familiar to all ophthalmic surgeons, distinguishes as many as 24 varieties, 12 paretic and 12 concomitant. It is consoling, however, to know that comparatively few cases of heterophoria require any treatment, when they are found in people leading an ordinary life. In airmen, however, the case is different. As a rule, the call on the reserve power of the eye-muscles to correct any slight defect of horizontal movements or of convergence involves no undue strain on the nervous system of those engaged in the ordinary pursuits of life. But when the nervous tension is at a very high pitch, as in a forced landing from an aeroplane, any extra call on the nervous system necessary to correct a faulty balance of the eye-muscles may prove to be the needle which breaks the camel's back. Group-Captain E. C. Clements, who took part in the discussion, has done yeoman service in bringing this aspect of the matter to the notice of the authorities of the Royal Air Force, and instituting not only tests for the condition but ocular exercises designed to cure it. For the ordinary civil population, however, there is a general agreement that the only variety of heterophoria that commonly needs treatment is hyperphoria. The reserve power of the vertically acting muscles when they are called upon to adjust a difference in height between the two eyes is comparatively slight. In these cases symptoms, and even occasional diplopia, are not infrequently found, and can be counteracted by the prescription of appropriate vertically-acting prisms. In extreme cases operation by advancement may be called for. The prescriber of prisms is faced at the outset by the complication that there are at least four different systems of nomenclature of prisms commonly used. Fortunately in the case of three of them the differences in deviating power for corresponding numbers is negligible for prisms of low power such as are generally used. In the case of the fourth system (angle of deviation) the number of the prism represents just about double the deviating power of that of the corresponding number of the other systems. The wholesale prescribing of prisms is indefensible; the one condition other than hyperphoria in which the prism may serve a useful purpose is that of weakness of convergence. In young people the range of convergence often varies with the state of health, and the proper treatment for weak convergence is often tonic, assisted by exercises rather than the prescription of prisms. In old and debilitated people, however, the condition may be more or less permanent, and much benefit may accrue from the wearing of low prisms, base in, for reading. If it be asked how can a low prism of one or two degrees have an appreciable effect in dealing with deviations many times that amount, the answer was supplied by Dr. Maddox when he pointed out that it was the last degree of stretch of the fusion reflex which was most fatiguing. In esophoria prisms are seldom called for; in the case of hypermetropes it is better to order a fully correcting spherical glass, so as to cancel the reinforcement of the tendency to converge which accommodation for a near point naturally brings with it. Similarly with presbyopes who show exophoria it is better to order them weaker spherical lenses than would be given if they were orthophoric.

MASTURBATION AND THE CHILD.

Any youth walking in a London street some thirty years ago ran the risk of having thrust into his hand a pamphlet describing the terrible results of "solitary vice" and urging him to seek treatment from some pernicious quack. Police action has checked this indecency, but it occasionally reappears as an advertisement in some shady periodical where allusion to "lost manhood" is calculated to stir up those dreads that plague many physically healthy people who have at some time or other passed through a phase of masturbatory practice. Such an appeal to fear succeeds because there exists a widespread belief in disastrous results from masturbation, for which, however, modern medical literature offers no evidence. This frame of mind appears to be a survival from the eighteenth century, when Tissot, a physician of Basle and Fellow of the Royal Society of London, wrote a treatise upon Onanism which enjoyed a European reputation and appeared in several languages, an English translation having been published in 1766. Masturbation he describes as a corruption more baneful perhaps than small-pox, and he tells the reader in a preface that "where the writer must have less grounds to expect he shall convince by reasoning, than he has to hope he shall terrify by examples, too many cannot be recited." This lurid promise is well kept, and after some of his gruesome descriptions the impression upon his victim would certainly be, as the author hoped, "a dreadful portrait sufficient to make him retreat with horror."

Voltaire further popularised this method of approach; in 1836 Lallemand wrote a book in which masturbation was made the source of all evils, and the bogy flourished through the nineteenth century. Havelock Ellis, in the first volume of his "Studies in the Psychology of Sex," cites 29 authorities, including Gowers, who between them furnish a wonderful list of the signs and consequences of masturbation, ranging from insanity to warts on the hands, a list which should emphasise the advantage medicine now derives from the use of statistical methods and control groups. Even without these checks upon fantasy the influence of Tissot has greatly weakened, inasmuch as the subject is now rarely mentioned in text-books except to note the necessity of removing the torturing fears and remorse so frequently associated with masturbation, whether past or present, for the effect of the superstition upon the nervous and sensitive of either sex, both in childhood and adult life, is still familiar to those practitioners who deal with nervous people and have the courage to face the matter frankly. It is therefore with regret that we notice the circulation of a set of booklets, issued by an imposing authority and lately recommended in a letter to the *Times* as guides for giving sex instruction to boys, in which the terrifying method is perpetuated. The boy of 14 is to be told that because of the connexion of the private parts of the body with the spine and brain "it follows that, if you meddle improperly with these parts, your brain will suffer"; he is also to be warned that "many lives have been cut short by disease brought on by giving way to this bad habit in boyhood."

To place this literature, under the guise of sex instruction, in the hands of boys or parents can do only harm, especially when we recognise that a masturbatory phase occurs commonly in the development of boys and girls—though the terrorists fortunately exclude girls from their scheme of activity. The late Dr. Clement Dukes estimated that masturbation occurred in about 90 to 95 per cent. of all boys at boarding school, and although he traced it entirely to the example of the already initiated yet we know now that it quite commonly arises spontaneously and remains a solitary practice. It has not yet been shown to be a primary cause of trouble, though even without specific external influence it often attracts to itself the sense of dread and shame with which the subject of sex is often invested in the mind of the badly instructed child; but the withdrawal of a child from wholesome interests into a world of solitary indulgence must be regarded as a signal of nervous or temperamental difficulties. It is these difficulties that call for treatment, and any emotion about masturbation should be checked by the investigator asking himself what is the object of treatment in any particular case. When that question is fairly answered we may hope to help the child without adding to his difficulties or sowing the seed of later troubles.

THE MEDICAL GROUP IN PARLIAMENT.

Medicine has increased its representation and the new House of Commons, when it assembles on June 25th, will include 18 members of our profession. Their number is some 50 per cent. greater than ever before, and although we have never said a good word for vocational representation in Parliament, we heartily rejoice that there will be so many able to place medical knowledge and experience at the service of the two Houses. The Commons are increasingly occupied with large measures of social reform which have a medical side, and whatever Government may be directing the destinies of the nation, the closer application of hygiene to industrial life can hardly be long delayed. For the first time in our Parliamentary history a medical woman will sit in the House, and in Dr. Ethel Bentham we have one who associated herself with the care of infant life and child-bearing long before they became the concern of all thoughtful people. Dr. Stella Churchill, another protagonist of child welfare, who was unsuccessful at the poll, nevertheless made a good show with nearly 11,000 votes to her credit.

A complete list of medical candidates, successful and unsuccessful, with the voting figures, is given on p. 1210, from which it may be seen that the proportion attached respectively to the Conservative, Liberal, and Labour organisations matches closely the political complexion of the new House as a whole. As an illustration of how little anyone can be regarded as a candidate for medicine, we need only recall that in two constituencies medical men opposed each other, to their own discomfiture. In one case this has resulted in the exclusion of Sir Thomas Watts, whose unconventional views on many matters, especially health insurance, enlivened the House. Two other medical members who were sitting at the dissolution have failed to re-establish their seats, and will be keenly missed. Sir Richard Luce's occasional contributions to debate were always marked by reasonableness and by intimate knowledge of his subject, and medical men in the Services found a good friend in him. The loss of Sir Henry Jackson is palpable, and we hope that he will be given the opportunity of entering the House in some other way. Of the new medical Members several, including Dr. Forgan, Dr. Morgan, and Dr. Spero, have already fought at previous elections. Mr. Somerville Hastings resumes the seat which he occupied in the 1923-24 Parliament, and Mr. Christopher Addison returns to the arena where he formerly occupied a prominent position. Among the 20 unsuccessful candidates, we may specially regret the failure of Dr. Lyster at Winchester in his attempt to gain a seat as an active member of the public health service.

While the party element must, as we have seen, have played a large part in the election of these 18 Members, they will now take their places as units of a Parliamentary Medical Committee which is quite outside party and considers with a single eye the broad interests of medicine. On this Committee they will no doubt be joined, as heretofore, by certain coöpted University representatives as well as by the two medical peers, Lord Dawson and Lord Moynihan. The Chairman of this Committee, Dr. Fremantle, has on public health questions an authority which has been enhanced by his recently published books, and Dr. Drummond Shiels, whose Parliamentary and professional life cover almost the same period of time, will, it may be presumed, continue to be the active and efficient honorary secretary of this group. In practice a common finding has been secured on most important medical questions of the day, and if there should be some divergence of view on the function of the State in regard to hospitals and the provision of health services, it is well that there should be within the precincts of the House of Commons a medical forum for their quiet discussion and for the discovery of a common policy.

Portsmouth Eye and Ear Hospital.—It was stated at the annual meeting of the Portsmouth and Southern Counties Eye and Ear Hospital that the work was hampered for lack of space; last year there were 24,500 out-patient attendances. It is the only specialised hospital in Hampshire.

Annotations.

"Ne quid nimis."

THE KING'S HEALTH.

ON the eve of public thanksgiving for his complete recovery to health the King's convalescence has had a setback. Early last week he was confined to his room with a feverish attack, the announcement of which, with characteristic considerateness, was kept back until the general election had taken place. On Saturday it was added that an abscess had formed under the site of the old scar on the right side of the chest, and was then draining. After the week-end a bulletin signed by Sir Stanley Hewett and Lord Dawson, as well as by Mr. Henry Martyn, Surgeon-Apothecary to the King's Household at Windsor, contained the news that healing of the abscess was following a normal course, which in the nature of things must be tedious. This announcement and the fact that no necessity has been seen for the issue of daily bulletins have had the effect of restoring confidence, which was inevitably shaken by the association of a feverish attack with a fresh effusion. The trouble is clearly a local one and although confined to bed, His Majesty is able to transact public business and we may look forward with confidence to complete closure of the wound. There is happily nothing in the occurrence to dim the achievement of those who have borne the responsibility of the King's treatment during his illness, and whose names are fittingly mentioned in the list of Birthday Honours which follows.

BIRTHDAY HONOURS.

IN the official list of honours conferred by the King on the occasion of his sixty-fourth birthday the medical recipients include those who were His Majesty's advisers during his recent serious illness. In this important connexion Lord Dawson of Penn is created a Privy Councillor, baronetcies are conferred upon Sir E. Farquhar Buzzard and Sir Hugh Rigby, while Dr. Stanton Woods is knighted. Further, Sir Humphry Rolleston has been created G.C.V.O., Sir Frederick Stanley Hewett K.C.B., Dr. F. E. Shipway K.C.V.O., Dr. F. D. Howitt and Dr. L. E. H. Whitby C.V.O., and Dr. E. C. Dodds M.V.O.

The general list of members of the medical profession, including the one or two who are closely associated with it, who have received honourable recognition of their work, includes Dr. Grafton Page, Treasurer of the Commonwealth of Australia, who has been created a Privy Councillor. In the Orders of Chivalry the O.M. has been conferred upon Dr. Robert Bridges, Poet Laureate; in the Order of the Bath, Dr. M. A. Cassidy, chief medical officer of the Metropolitan Police, receives the civil C.B. (the occasion being the centenary of the Force) and Rear-Admiral H. C. Whiteside and Maj.-Gen. H. P. W. Barrow, Director of Hygiene at the War Office, receive the Military C.B.; the C.M.G. has been awarded to Dr. W. J. D. Innes, Director of the Medical and Sanitary Services of the Gold Coast, and to Mr. O. F. H. Atkey, F.R.C.S, Director of the Sudan Medical Service; in the Order of the Indian Empire Maj.-Gen. R. W. Anthony, Surgeon-General with the Government of Bombay, and Mr. Charles Albert Bentley, Director of Public Health in Bengal, have received the C.I.E., and in the Royal Victorian Order, in addition to those already mentioned, Lt.-Col. Gordon Carter has been created a K.C.V.O. In the Order of the British Empire, Maj.-Gen. T. H. Symons, the Director-General of the Indian Medical Service, and Dr R. H. Stawell, President of the Melbourne Hospital, have been created K.B.E. The following have received the C.B.E.: D.M. Macrae, P.M.O., Bechuanaland Protectorate, Col. A. H Safford, late R.A.M.C., Assistant Director of Medical Services, Baluchistan District, Dr. A. Sandison, P.M.O., Ministry of Pensions, and Lt.-Col. J. W. Watson, I.M.S., Civil Surgeon, Ajmer and Chief M.O. Rajputana and Ajmer-Merwara; the following have received the O.B.E.—namely, Maj. D. G. Cheyne, R.A.M.C., Deputy Assistant of Hygiene in the China Command, Maj. Jamshedji Nusserwanji Duggan, I.M.S., Professor of Ophthalmic Medicine and Surgery, Grant Medical College, Bombay, Capt. P. F. A. Grant, I.M.S., Squadron Leader (Hon. Wing Commander). E. Huntley, R.A.F., Mr. P. F. Mathias, Superintendent of the Government Royapuram Medical School, Maj. J. C. Pyper, I.M.S., late M.O. Equitation School, Saugor, India, Dr. I. D. Ramsay, Civil Surgeon, Ministry of Interior, Iraq, Surg.-Commander F. L. Smith, R.N., Mr. George Stuart, Assistant Director of Laboratories, Department of Health, Palestine, and Capt. S. H. Woods of the Army Dental Corps; while the following have received the M.B.E.: Dr. T. Fawsitt (for Public and charitable services in Oldham), Mr. W. P. S. Mitchell, M.O. of the Bastár State, Central Provinces, Dr. Socrates Noronha, M.O. in charge of the Anti-venereal Department in the Bombay Municipality, Dr. C. B. Philip, M.O., Kenya, and Mr. J. H. Theodore of the Indian Medical Department, King Institute, Guindy, Madras. Dr. P. Chalmers Mitchell, the secretary of the Zoological Society, and long associated with medical education as a biologist, and Professor Colin MacKenzie, Director of the National Museum of Australian Zoology, have been knighted.

To all these we offer our sincere congratulations, while we note the progressive wiping-out of the old reproach that in these awards workers in distant parts of the Empire fail to be forgotten.

A NEW ZEALAND RADIUM CENTRE.

THE annual report of the Radium and Deep Therapy Department of the Christchurch Hospital, New Zealand, which has just reached us, is the fourth from the pen of Dr. P. Clennell Fenwick, and is commended by Dr. Walter Fox, the medical superintendent, as evidence of progress abreast of that to be observed in other radium departments. Only in our issue of May 25th we published some interesting observations from this department on malignancy following trauma. With the exception of the treatment of menorrhagia, where there is a concise description of the method employed and a detailed account of the results, not only with regard to the main symptom of hæmorrhage, but also as to the occurrence of menopausal symptoms, it is not altogether easy to obtain information from the report itself as to the exact technique in use at Christchurch. A total of 508 milligrammes of radium element seems to be distributed amongst seven small plaques and 81 tubes or needles, none of which exceeds 25 mm. in gross length, with an active length of, say, 15–20 mm. As, however, in treating epitheliomata of the skin, needles each containing 5–10 mg. of element are implanted in and around the lesion, it may be surmised that the technique employed is largely one of high intensity with short duration. If the application is repeated two or three times within a period of three or four weeks, as practised at Stockholm for carcinoma of the cervix uteri, this line of treatment will be seen to conform to some modern practices, although in Great Britain, in America, and on the Continent of Europe the present tendency is to employ relatively small linear intensities for periods of a week at least in the treatment of carcinoma of the mouth and tongue, carcinoma of the skin, and carcinoma of the breast—to mention three main sites of application. The explanation of this practice may lie in the fact that only radium element is used at Christchurch, a procedure which does readily allow of changes in technique. The extraction of radium from fixed containers, its remeasurement, and, finally, its redistribution, is a lengthy business, even where highly skilled technical help is available. It is for this reason that radium centres which at their conception adopted principally an emanation technique have reaped the benefit of being able to adopt any technique which the experience of other schools has shown to give better results than their own. At Christchurch the best results were apparently obtained in menorrhagia where, of 76 cases treated since 1924, 73 are free from symptoms. The routine treatment for this condition was 50 mg. RaE screened by 1 mm. of platinum and 1 mm. of rubber for 24 hours. In carcinoma of the cervix uteri 26 out of 48 cases treated between 1925 and 1929 are alive, and of 13 cases treated in 1925 4 are still living. The report emphasises the fact that no cases are refused treatment, and that this tends to make the results suffer by comparison with centres where cases are selected. Two cases of primary carcinoma of the breast were treated by implantation for 24 hours with satisfactory immediate results, but the treatment of carcinoma of the breast, recurrent after surgical operation, is described by Dr. Fenwick as a sorry business—an opinion which will be shared by most experienced workers. Some 88 cases of "ulceration and growth on lip" have been treated since 1924. Rightly, in the opinion of an increasing number of workers, tissue was not removed for diagnostic purposes; as no case was treated that had "any sign of glands under the chin," Dr. Fenwick must have had a remarkably early series of cases to deal with. Unfortunately, 34 of the series failed to report again. Of 117 cases of previously untreated rodent ulcer, 112 responded fully to treatment, the technique of which is not given. Cases recurrent after treatment by X rays, caustics, or surgery did not respond so well. For nævi and angiomata radium is said to have proved a specific remedy; of 115 cases treated, 12 are still under treatment and 103 are symptomless. These are striking figures if it is implied that no stigmata such as telangiectasis remained. Deep X ray treatment is also given at Christchurch, either alone or to the lymphatic drainage area after the primary growth has been treated by radium. The activities of the department also include treatment by ultra-violet light and endothermy.

THE SERUM TREATMENT OF ACUTE ANTERIOR POLIOMYELITIS.

A FEW months ago, at a symposium on poliomyelitis held in Melbourne, Dr. Jean Macnamara commented on the encouraging results recorded[1] in Australia and New Zealand with the serum treatment of this disease. In 1924–25 the serum of convalescents was used extensively in Wellington, Dunedin, and other centres, and from the observations made during this trial period the New Zealand Department of Health drew such favourable conclusions that in its report to Congress it stated: "Human convalescent serum was found to be a specific in producing prompt recovery and preventing paralysis if given in the preparalytic stage" It is agreed that once paralysis is established no benefit is to be got from the administration of serum except in the uncommon cases of the "spreading" (so-called Landry) type. The difficulty of recognising poliomyelitis in the preparalytic stage has often been emphasised, but in Wellington after the first few weeks of the epidemic, as a result of the awakened interest of the public and the alertness of the medical profession, 60 per cent. of the patients were admitted to hospital at a stage suitable for serum treatment. In Victoria, Australia, the experience of serum treatment in the outbreak of 1925 was such as to lead to the establishment of a serum service for the State, and, although no figures are yet available, Dr. Macnamara's remarks on the results obtained with its help in the 1928 epidemic were very encouraging. In two papers published within the last few weeks records have been given of the results of similar treatment in Canada and in the United States. In the *Canadian Medical Association Journal* a résumé[2] is given of the results in the Manitoba outbreak last year, and in a paper read before the American College of Physicians in February, 1927, but only now appearing in print, Dr. Wardner Ayer[3] gives the results of 126 cases in which serum was administered, representing his personal experience of the treatment up to the end of 1926. In Manitoba last year it appears that 161 cases were recognised; 74 were treated with serum in the preparalytic stage, 54 received no serum, and 33 had serum after the onset of paralysis. We may consider first the group in which no serum was given, as it shows the results of the disease uninfluenced by immune therapy; in this group 26 per cent. of the patients recovered without paralysis, 63 per cent. were paralysed, and 11 per cent. died. In the group in which serum was given late there were many severe cases, and allowing for this the outcome was similar to that of the untreated group; 22 per cent. recovered without paralysis and 45 per cent. with residual paralysis, while 33 per cent. died. Of the cases treated with serum in the early stages 93 per cent. made a complete recovery, 7 per cent. had residual paralysis, and there were no deaths. The group is divided into two subgroups, the first consisting of 57 cases which received a single dose of serum intramuscularly and the second of 17 other cases in which serum was given by other routes or in more than one dose, but the results in the two subgroups were almost identical. The figures of the epidemic are subjected to considerable analysis, and the results of treatment are given for separate months and for town and country cases. From the second paper we learn that of the 126 patients to whom Dr. Ayer gave serum at Syracuse, New York, in the six years 1921–1926, 93 (74 per cent.) recovered without paralysis. Forty-six cases were seen in the first 24 hours of the illness; in these there was one death, one extensive and three mild paralyses, while 41 patients (85 per cent.) recovered without demonstrable involvement of the spinal cord. Sixty-nine were seen and given serum during the second 24 hours, and the percentage of complete recoveries was 71 (49 patients). But of 11 patients to whom serum was given more than 48 hours after the onset, three died, three were severely paralysed, two mildly paralysed, and only three recovered without paralysis. (In this group the proportion of recovery is approximately that of the untreated disease.) The best average results seem to have been obtained in 1924, when Syracuse had 133 cases with 12 deaths; 61 cases were diagnosed in the preparalytic stage and treated with serum, and 50 of them (82 per cent.) ended in complete recovery without paralysis.

In Victoria, from the experiences of 1925 and 1928, it was judged that the best results were secured by combining intravenous and intrathecal administration of serum. The doses were varied according to the size of the patient but were not less than 50 c.cm. In Manitoba the serum was given intramuscularly, the standard dose was 25 c.cm., and the recorded results are as good as any. In Syracuse Ayer used the spinal route exclusively, considering the intravenous route wasteful of serum; the amount given was from 10 to 25 c.cm. according to the size and age of the patient, but it should be noted that with these doses it is his practice to give in some cases a second dose of serum. Further, Ayer, who got his serum by advertising for donors, apparently had not always a sufficient supply available. In 31 cases he gave patients antipneumococcal serum, and in eight of these he followed it up with a dose of human convalescent serum; but as far as he could determine there was no great difference between the results of giving antipneumococcal serum and those of specific therapy by human serum, and he suggests that the beneficial effect of non-specific sera may be partially due to phagocytic action consequent upon additional aseptic meningitis excited by the introduction of serum into the theca. At the same time he strongly urges the use of human convalescent serum when available.

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[1] Med. Jour. of Australia, 1928, ii., 266.

[2] McEachern, J. M., Chown, B., Bell, L. G., and McKenzie, Mary: Can. Med. Assoc. Jour., April, 1929, p. 369.

[3] Ayer, W.: Amer. Jour. Med. Sci., April, 1929, p. 540.

The greatest difficulty in the application of serum therapy to poliomyelitis in this country lies in recognising the disease in the preparalytic stage, and it has been seen that in other countries that difficulty has not been insuperable. Diagnosis depends on examination of the cerebro-spinal fluid—which must be done at once—but the clinical signs and symptoms by which the preparalytic stage is provisionally recognised are as follows (Ayer):—

1. *Fever:* never high, the average being 102° F.
2. *Headache:* severe, frequently general but may be only nuchal: it may be absent but is then replaced by severe pain in the back.
3. *Rigidity of the neck:* distinct resistance to anterior flexion; there is never lateral limitation of movement. (The "spine sign" consists in an unwillingness to bend the body forward.)
4. *Tremor:* fine trembling of the lips and hands especially during movement, as when taking a glass of water: there may also be coarse twitching in sleep.

Accompanying symptoms are: vomiting (once or twice on the first day), constipation, retention of urine for 12–24 hours, sweating about the lips and neck, and a certain degree of mental apathy, though the patients when once roused are bright and alert and may be irritable.

Early diagnosis is naturally easier when an epidemic is in progress, but even in the absence of any definite epidemic much could probably be done during the season when poliomyelitis is prevalent to facilitate its early recognition not only by putting practitioners on the look-out for its early signs but also by guarded instruction of parents and teachers through the newspapers and wireless, with insistence on the importance of calling the doctor immediately to a suspected child, time being an essential factor.

LIVER IN SECONDARY ANÆMIA.

THE value of liver in pernicious anæmia requires no further confirmation, but its effect on secondary anæmia has so far remained somewhat uncertain. Since the experiments which originally led to the adoption of treatment were done on dogs suffering from anæmia induced by hæmorrhage it is hard to believe that liver has no influence on secondary anæmia of this kind at least. The matter has recently been investigated by Dr. W. P. Murphy and Dr. J. H. Powers[1] at the Peter Bent Brigham Hospital at Boston. Working on 17 cases of anæmia due to acute or chronic hæmorrhage they have found ample evidence of the beneficial effect of whole liver, their patients receiving at the same time a carefully prepared diet comprising large quantities of fresh fruits and green vegetables and iron in full therapeutic doses. In our present issue Dr. S. C. Dyke reports on a smaller series of cases observed at the Royal Hospital, Wolverhampton. Instead of whole liver Dyke used a commercial liver extract and he also early came to the conclusion that the effect of the liver was greatly enhanced by the simultaneous administration of iron. Arsenic was found to have little effect in improving the blood picture, but Dyke's series of observations is admittedly small. Comparing these two papers it is interesting to observe that while the Boston patients were on a specially designed dietary and the Wolverhampton ones on the ordinary hospital diet, the results were very much the same. Whipple and Robscheit-Robbins[2] having stated that the action of whole liver and of liver extract are not identical, it may be noted that Dyke's patients on a commercial liver extract and those of Murphy and Powers on whole liver showed a very similar response. Even better results might perhaps have been got by combining whole liver with an extract, and this is a possibility which needs further exploration. It must be noted that in both the American and the English series all those patients recorded as showing a response to liver therapy were suffering from secondary anæmia resulting from hæmorrhage. It remains to be seen what the effect of the treatment may be in other types of anæmia.

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[1] Murphy, W. P., and Powers, J. H.: Surg., Gyn., and Obst., April, 1929, p. 490.

[2] Whipple, G. H., and Robscheit-Robbins, F. S.: Amer. Jour. Physiol., 1925, lxxii., 408.

THE ASSESSMENT OF PHYSICAL FITNESS.

IT is hard to estimate physical fitness accurately, and if serious mistakes are not very common we must attribute this to experience and common sense rather than to the scientific exactness of the methods at our disposal. A person's general fitness depends essentially, though not entirely, on his cardiac efficiency, and this is the factor investigated by most of the usual tests. Modern radiological and electrocardiographic examination not being possible in the vast majority of cases in which the heart's action is to be studied, the practitioner must often turn to readily available and simple methods. These are based upon the heart's response to a varying degree of exertion, and are almost numberless in their modifications. Two such tests,[1] used in the examination of the University crew at Cambridge are the "dumb-bell test" and the "40 mm. Hg U-tube test"; in the former the effect upon the pulse-rate of hard dumb-bell exercise for one minute is noted, and in the latter, which is also employed in examining candidates for the Royal Air Force, the pulse-rate is counted in 5-second periods whilst the subject is maintaining the level of a column of mercury which he has blown up to a height of 40 mm. In both cases rapid and undue increase of pulse-rate and a delayed return to normal are considered unsatisfactory. Such moderate physical exercise should not increase the pulse-rate in a fit man by more than 20 or 30 beats per minute; at the same time the amount of the rise is possibly less significant than the length of time taken before its return to normal, which should be not more than 1½ minutes at most. All such tests, as well as those relying upon changes in systolic and diastolic blood pressure with movement or exertion, are open to many fallacies. They depend largely on the reserve strength of the heart muscle and do in fact offer a fair indication of this power; but they do not give a reliable answer to the question how much exertion may be harmful to a heart and how much may be beneficial. And this, of course, is often just what the medical man and his patient want to know. Dr. F. W. Law's investigation, to which a reference has already been given, leads him to conclude that no exercise, however strenuous, can permanently harm the healthy trained man, and quotes F. Bainbridge as saying that "there is no direct evidence that, provided a man is physically sound and in good health, exercise, however severe, is ever harmful or followed by serious after-effects." It is, however, exactly in the elimination of those not "physically sound" that the difficulty arises. Daily heavy work, and still less our cardiac efficiency tests, may not always bring to light latent cardiac weakness; as Hoffmann has written "the heart gives no warning of the moment at which exertion becomes harmful." Clive Rivière, for example, noted cardiac dilatation persisting two and a half months after a week's holiday of walking and climbing in 10 out of 40 school-boys he examined (as noted by Law), and there is no doubt that definite dilatation of the heart may follow over-exertion in the unfit, with but little subjective evidence of disorder. On the other hand, the healthy heart becomes slightly smaller immediately after violent exercise, as has been shown radiographically by Moritz, Mobitz and others, and many deny that physiological hypertrophy ever follows excessive athletics. Deutsch[2] found that 90 per cent. of swimming and ski racers had hearts of normal size, and holds the view that "sport-training means heart-training," true fitness implying an absence of enlargement of the heart with exertion. According to this view, hypertrophy of the heart in an athlete suggests over-strenuous exercise of an "unfit" subject, but Law, after his own rowing career, finds definite enlargement of his heart which by all clinical and subjective signs is perfectly healthy, and concludes that physiological enlargement of a healthy heart may result from hard and prolonged exercise. Deutsch says that approximately one-quarter of rowers he examined had enlarged hearts, the proportion being much greater than among men going in for any other sport. Whether the "sports heart" is always a heart which was already unhealthy before athletics were begun is still a matter for discussion, but it will be generally agreed that lasting damage to the heart from over-exertion is exceedingly rare in a previously healthy person; the figures of Morgan, quoted by Law, concerning the after-histories of the 255 survivors of the Oxford and Cambridge boat-race crews from 1829 to 1869 bear out this opinion. The practitioner's task of detecting people in whom harm may result is thus all the more important, and the decision may be one of the most difficult of those he is called on to make. A careful clinical history, a detailed physical examination, a judicious consideration of the results of functional efficiency tests, combined with a study of the urine and if possible of radiological and electrocardiographic records are his guides. First and foremost, however, he must be given the chance of examining his patients properly. The necessity for medical examination—if possible at suitable intervals—of all those who undertake strenuous exercise can hardly be too strongly emphasised.

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[1] Law, Frank W.: Some Clinical Aspects of Muscular Exercise, Quart. Jour. Med., April, 1929, p. 461.

[2] Deutsch, F.: Das Sportherz, Wien. Med. Woch., 1928, lxxviii., 632 and 670.

THE COCKTAIL HABIT.

ALCOHOLISM has for several generations been regarded as a disease of the poorer classes. It is, however, becoming increasingly obvious that the balance is shifting, and some authorities consider that before long the incidence will preponderate among persons of wealth and leisure. The reason for this change lies in the increase of the "cocktail habit." Before the war cocktails were regarded as an American innovation; they have now become a part of the social life of every European country. They are taken primarily as appetisers, but tend to degenerate easily into a pastime. Their attraction is partly due to their endless variety, and their chief danger lies in the powerful effect which they exert by reason of their aromatic constituents. The alcohol in a cocktail, which composes 15 to 30 per cent. of its volume, may be contained in gin, whisky, or brandy, the vermouth, angostura, and liqueurs, which are added as flavourings to the different varieties, contain essential oils with a strongly exciting action on the central nervous system. The reason why the alcohol in a cocktail produces an effect in the central nervous system more than four times as great as that of the same amount of alcohol taken in beer is explained by Prof. W. E. Dixon in the *British Journal of Inebriety* for January. The spirit is absorbed very rapidly from the empty stomach, its absorption being facilitated by the irritant oils. During its passage from the blood into the nerve-cells it produces a great and sudden increase of tension on the outside of the membranes, thus causing a powerful stimulant action which continues until the tension becomes equal in the nerve-cells and the blood. This action, which lasts for about a quarter of an hour, is different from, and much more potent than, the subsequent ordinary effect of the dose of alcohol. According to Prof. Dixon, the persons who take a cocktail to diminish nervous strain and stimulate the appetite are not the true cocktail addicts. The most deleterious effects are produced in young men and women who drink to remove their shyness and to produce excitement. The continuous use of cocktails injures the stomach and lays the foundation for the drinking habit, which is easily acquired by the young. They supply for a moment the new sensations, strong emotions, and varied interests which youth desires, and tend more surely and rapidly, in Prof. Dixon's opinion, to become a habit than do any other kinds of beverage. Prof. Georges Guillain, in a recent lecture before the Academy of Medicine,[1] which we noticed in our issue of May 25th,[2] takes a serious view of the increase of cocktail drinking in France. Cocktail parties, he says, have replaced tea parties in many modern drawing-rooms. The miniature bar has become an article of household furniture, and is part of the equipment of the furnished flat and the motor-car. The cult is not confined to Paris, but pervades country houses, watering-places and even spas. He gives recipes for ten of the commonest cocktails, to show the large quantity of alcohol they contain, and remarks that young persons never used to take whisky or gin before their meals, but that nowadays they drink several of these mixtures every day. He maintains that he is constantly observing most serious symptoms among the young people who indulge in this habit. Their ailments include all kinds of digestive trouble, permanent tachycardia and attacks of syncope, insomnia, neurasthenia, anxiety, and failure to concentrate. Many divorces, motor accidents, and ruined careers are, he holds, due directly to habitual indulgence in cocktails, but it is possible that cause and effect are here rather difficult to disentangle. Prof. Guillain claims to have witnessed a dramatic transfer of the incidence of alcoholic polyneuritis which formerly predominated among the working classes, especially, it seems, those suffering from tuberculosis, to young men and women of the wealthy classes. He draws a picture which has fortunately not yet been equalled in this country, but the evil, even here, is none the less well established and demands the determined opposition of every medical practitioner. The rigid rules laid down by all physicians for cases of suspected or established juxta-pyloric ulcer concern the avoidance of alcohol on an empty stomach, and the universal application of the precept would prevent much chronic dyspepsia and be found in the long run not to detract from the gaiety of social life.

REALITY.

IT is not so long ago that what were called "functional diseases" were treated with a mixture of contempt and brutality by all except a few medical men in advance of their times. It was a period when to be "real" was to be concrete; diseases had to have a tangible morbid anatomy and the deepest probings of the chemists and physicists into the structure of experience found their most complete satisfaction in the production of models made of billiard balls or machinery. Biologists in general, and those involved in medicine in particular, often felt dissatisfied, especially when they were assured (as they frequently were) that the only road of progress was the "real" path carved by the "exact sciences." It is therefore particularly impressive that it should be a physicist in Prof. A. S. Eddington's unrivalled position who comes to tell us that the physical explanation of the world is no more concrete than anything else, and that it is quite incomplete in that it fails to include large parts of our experience. He restated his position recently in the Swarthmore Lecture before the Society of Friends.[3] The modern physicist has given up his old objective of models; he aims instead at a set of symbols and mathematical equations which they will satisfy. And, strangest change of all, he no longer cares what the symbols stand for: he seeks to know how reality behaves, not what it is. In consequence he no longer wants to condemn the spiritual side of our experience as illusory because it is not concrete. "Mind," he says, "is the first and most direct thing in our experience; all else is remote inference."

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[1] Académie de Médecine, 1929, p. 538.

[2] THE LANCET, May 25th, p. 1113.

[3] Science and the Unseen World. George Allen and Unwin. 1s. 6*d*.

The physicist moreover not only does not dogmatise about the nature of the reality with which his symbols deal, he insists that his professional methods of inquiry cannot penetrate behind the symbols and are quite unsuited to throw light on what they represent. Prof. Eddington—we do not know how far his colleagues are with him here—is not content to leave it at that: he frankly claims that it is by our spiritual nature that we may attain the interpretation of the symbols which science cannot give. No one will suspect the Plumian Professor of advocating loose thinking when he urges upon us the necessity of a mystical outlook. If we limit ourselves and take no cognisance of anything but "scientific facts" as ascertained through our sense organs, we are denying one of the most real items of experience, that consciousness is not wholly or even primarily a device for receiving sense impressions. Science is good enough as far as it goes: the scientist is guided by no false or mean light. But it has nothing to tell us of its own passion for truth, of men's response to beauty, of our inner light of guidance and conviction: they are none the less "real."

THE REOPENING OF THE WELSH NATIONAL MEDICAL SCHOOL.

THE terms on which the wards of the Cardiff Royal Infirmary will be reopened to students in September next, of which the main provisions were announced in THE LANCET last week, have been formally and unanimously ratified at a meeting of the Board of Management of the hospital. The unanimity was the result of a special appeal made by Sir William James Thomas, the benefactor to whose unquenchable optimism the School owes not only its inception but also continuous encouragement in the struggle against direct and indirect opposition. The new agreement provides that the unit system shall continue, but that the non-professorial clinics are to be organised in future under the supervision of a Board of Clinical Studies on which members of the honorary staff are to be fully represented. This Board is, moreover, to have direct access to the Board of Medicine of the College, though before any action is taken the Faculty of Medicine of the University, on which the full-time professors have a predominant vote, will be consulted. In this way the honorary staff of the Royal Infirmary are aasured that attention will be given to their views on matters connected with clinical teaching. A clause providing that assistants in the professorial units shall "normally" be full-time officers will be put into force as soon as funds permit. The only clause which still evoked a protest even at this final meeting, though it had already been modified to the limit of safety, was the provision that the infirmary shall hold all its beds at the disposal of the School for the purpose of clinical teaching. The very fact that objections were offered to this clause suggests that the College authorities were wise in their resolution to refuse to enter into any agreement without such a safeguard. In its absence, the resignation of certain members of the honorary staff of the hospital from their posts as university teachers reduced the number of teaching beds below that required for recognition of the clinical school by the University of London and the Conjoint Board and led to its closure. These licensing bodies will have to be convinced of the impossibility of a recurrence of such a withdrawal before they reconsider their decision, and, moreover, if the students scattered through the country are invited to return to their National School their careers must not again be imperilled. The new agreement has been drawn up expressly with a view to ensuring that the clinical curriculum and the organisation of the teaching are acceptable to the honorary staff of the hospital, and is to continue in force for a period of seven years. Machinery is, however, provided for the revision of the terms in three years, should this be considered desirable by either party. Ample opportunity will thus be found for adjustment of difficulties through legitimate channels, and in view of the disaster of last year, no clause designed to render ineffective a threat of direct action can be fairly stigmatised as either unnecessary or harsh. The early history of some of the most successful medical schools has been a stormy one, and the staff of a hospital which has become part of a teaching school cannot be expected immediately to welcome the changes involved. But now that agreement has been reached we trust that the Welsh National Medical School will be re-established on a firm foundation and will fulfil its early promise.

THE FATE OF PATIENTS WITH PLEURISY.

APPRECIATION of the tuberculous nature of most cases of "idiopathic" pleurisy has focused attention on the treatment to be given after the acute symptoms have ceased. Is it enough to send the patient away for a month's holiday, with vague injunctions about rest and exercise, or should he be kept under close medical supervision and given several months of educational treatment in a sanatorium? There are some interesting statistics wherewith to answer these questions. Among the most important are those of the Swedes, Allard and Köster, whose investigations in the period 1910-11 showed that in approximately half their cases of pleurisy pulmonary tuberculosis became active at a later date. The more recent investigations of the Norwegians, Scheel and Föien, showed that of 812 patients suffering from pleurisy in the period 1916-25, and examined early in 1927, as many as 182, or 22·4 per cent., had subsequently developed pulmonary tuberculosis which in 80 cases proved fatal. In the *Norsk Magazin for Laegevidenskapen* for April, 1929, Dr. L. B. Smith shows how the expectation of tuberculosis in this class of case can be bettered by a strict régime. At the Landeskogen Sanatorium, to which he is attached, his chief, Dr. E. T. Holter, if he cannot find room in his sanatorium for a patient with "idiopathic" pleurisy, gives him definite instructions on what he shall do. He is told to rest on his bed or a sofa for five to six hours every day, and is forbidden to do any work at all for at least three or four months, this prohibition holding so long as the rate of sedimentation of the erythrocytes is abnormal. In the period from May, 1916, to June, 1924, there were treated at the Landeskogen Sanatorium 90 patients whose pleurisy was the only clinical sign of pulmonary tuberculosis. Their subsequent fate was investigated in 1928. Of the 90 cases 66 were associated with a pleural effusion, whereas in the remaining 24 the pleurisy was "dry." The patients' ages ranged from 13 to 41 years, and the average duration of the interval between the onset of the pleurisy and admission to the sanatorium was six months. As many as 62 were under normal weight, and in 74 cases the patient's general health was poor. The average duration of residence in the sanatorium was 121 days. On discharge, 82 were fully fit for work, and 8 were partially so. Only one of these patients could not be traced in 1928. Of the remaining 89, as many as 79 were perfectly well. Three suffered from tuberculosis, and were only partly fit for work, while seven were found to have died of tuberculosis. Looked at only from the statistical angle, these figures are, of course, far too small to carry much weight. But in conjunction with our present-day knowledge of the evolution of pulmonary tuberculosis they do emphatically indicate the profit accruing to a patient from the interpretation by his medical adviser of "idiopathic" pleurisy as a condition requiring rigorous treatment and supervision for a long time.

SMALL-POX RESTRICTIONS IN FRANCE.—The regulations imposed last April on travellers from England obliging them to produce evidence of vaccination or submit to supervision of their movements has now been abandoned by the French Government.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XXXIII.—PLEURAL FLUIDS.*

ALTHOUGH it is unwise to place too much reliance on laboratory reports of a pleural effusion, these may be very valuable, not only as additional evidence for diagnosis, but also as an aid to treatment.

Pleural fluids may be considered under the following headings: (1) clear; (2) thick, of which the second class may be further subdivided into (*a*) non-purulent, (*b*) purulent.

CLEAR PLEURAL FLUID.

On inspection the liquid is usually pale yellow in colour and clots on standing. The clot is firmer in cases where the effusion is the result of inflammatory changes—i.e., an exudate—than when it is a transudate, for example, in a case of heart failure. A small quantity of blood may be present, but a large amount makes the liquid thick. The fluid is usually odourless unless contaminated, in which case it will rapidly become purulent.

Cytology.

Blood.—A few red corpuscles may be seen and are not important. To be of any clinical significance the blood must be present in sufficient quantity to be visible on naked-eye inspection.

Polymorphonuclear neutrophil leucocytes are seen in acute inflammatory conditions. Where polymorphonuclear cells are in excess the infection is probably due to a pyogenic organism, and if they are found in a clear effusion it is probable that the fluid will become purulent. These leucocytes are present in normal blood, so that in any effusion containing blood they will be found in the normal proportion to the red corpuscles; this, of course, does not indicate a pyogenic infection.

Small lymphocytes are present in excess in chronic inflammatory diseases, of which tuberculosis is by far the most common. In rare cases of long-standing effusion from other causes, an excess of small lymphocytes may be seen. Syphilis of the pleura is extremely rare, but if present would cause a preponderance of small lymphocytes in the effusion.

Widal and Ravaut in 1900 expressed the opinion that in cases of pleural effusion an excess of small lymphocytes indicates tuberculosis, and an excess of polymorphonuclear neutrophils indicates infection by a pyogenic micro-organism, and this view is generally upheld to-day.

Endothelial cells derived from the lining of the pleura may be present in excess and indicate a transudate. They are seen, therefore, in effusions occurring in cases of renal disease, heart failure, or obstruction of the circulation from neoplasm or other causes. It is often stated that an excess of endothelial cells is diagnostic of neoplasm. This is not so, but it is rarely present in cases of tuberculosis or pyogenic infections; thus, if there is no evidence of renal or cardiac disease in a case with a preponderance of endothelial cells in the pleural fluid, new growth must be suspected by a process of exclusion.

Eosinophil cells are rarely found in excess and are of no great clinical significance. They may be regarded as intermediary between the acute infection characterised by an excess of polymorphonuclear leucocytes, and the chronic stage where small lymphocytes are in excess. It is said that the presence of a large number of eosinophils in a pleural effusion is evidence against tuberculosis, and very few of the recorded cases have turned out to be tuberculous. In the uncommon cases when a clear effusion develops after pneumonia an excess of eosinophils makes it probable that the fluid will not become purulent, and is, therefore, evidence of a good prognosis. If the fluid is not from the pleural cavity but from a hydatid cyst, eosinophils will be present in great excess.

Tumour cells.—Cases have been described where a diagnosis has been made by finding free carcinoma or sarcoma cells in the pleural fluid. I have never come across such a case myself, and although they do occur they are extremely rare. It must be remembered that it is often impossible to tell the exact nature of certain cells in various stages of degeneration. Lymphocytes or endothelial cells might well be confused with sarcoma or carcinoma cells.

Bacteriology.

In a clear effusion the usual organism is the tubercle bacillus; in a purulent effusion the pneumococcus; in a cloudy effusion the streptococcus. Other organisms, such as staphylococci, the influenza bacillus, Friedländer's bacillus, the typhoid bacillus, &c., have been found but very rarely.

In the early stages of a tuberculous pleural effusion tubercle bacilli are not found as a rule, and even injection into a guinea-pig generally gives a negative result. In long-standing tuberculous effusions, and in nearly all cases of tuberculous empyema, however, the bacilli are almost always to be found. Various methods of looking for tubercle bacilli in pleural effusions have been described, but in doubtful cases the most reliable method is injection into a guinea-pig.

Chemical Examination.

This is not of great importance. The fluid is alkaline. Albumin is present in greater quantity in exudates than in transudates, and an exudate may become practically solid on boiling. The specific gravity of a transudate is usually below 1018, and that of an exudate above this.

The following table shows the chief characteristics of the common types of clear pleural fluids.

—	Appearance.	Coagulable proteid.	S.G.	Cytology.
Transudates—		Per cent.		
Renal	V.p.y.	2	1008	Endothelial cells.
Cardiac ..	P.y.	3	1016	
Neoplasm ..	P.y. or hæmorr.	3	1016	
Exudates—				
Tuberculous ..	Straw coloured.	Over 4	1020	Sm. lymph.
Pyogenic infections ..	Yellow and sl. turbid.	Over 4	1024	Polymorph.

V.p.y. = very pale yellow; hæmorr. = hæmorrhagic; sl. = slightly.

THICK EFFUSIONS.

Non-purulent.

Non-purulent effusions vary from the cloudiness seen when there is a slight excess of cells to the dense opacity of true chylous effusions. Blood may be present in any effusion and render it opaque. Hæmorrhagic effusions are said to indicate the presence of new growth, but they are not infrequently seen in cases of tuberculous effusions, and in the majority of cases due to malignant disease the fluid is clear.

In an analysis of 26 cases of carcinoma of lung, Dr. T. C. Hunt[1] found that an effusion formed in 13, and of these it was hæmorrhagic in 5, clear in 6, purulent in 1, and pseudochylous in 1. Bleeding, however, is more common in such cases, so that a large quantity of blood in an effusion may be taken as some evidence of new growth. In most cases the bleeding has taken place into an effusion; a true hæmothorax is usually the result of trauma. Sometimes the fluid appears milky owing to the presence of albuminous bodies or leucocytes. In the early stages of an inflammatory effusion, before it has become purulent, the fluid is often cloudy owing to the polymorphonuclear neutrophils, this is commonly seen in cases of streptococcal effusions.

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* An article on the Treatment of Empyema, by Dr. Burrell, will appear next week.

[1] THE LANCET, April 13th, 1929, p. 759.

Cholesterol may be present in an effusion of long standing, and gives the fluid a shimmering appearance like gold paint dissolved in spirit.

Chyliform fluids are sometimes seen when the cells are undergoing fatty degeneration. They are not common, but have been found in cases of endothelioma of the pleura or of chronic tuberculosis. The fat globules can be seen microscopically and stained with osmic acid. They can also be dissolved out with ether. True chylous effusions are very rare, but may result from rupture or injury to the thoracic duct, filariasis, pressure on the thoracic duct from tumours, &c., or occlusion of the left subclavian vein.

Purulent Effusions.

As a rule the pus is not offensive, but in some cases it may be extremely so. The offensive odour is due to contamination by a saprophytic organism, and is evidence of a communication either with the lung or the alimentary tract.

Empyema following spontaneous pneumothorax in cases of bronchiectasis or abscess of lung has very offensive pus, and, in any case, when there is a bronchial fistula the pus is apt to become offensive. The three usual types of empyema are those due to the pneumococcus, streptococcus, and tubercle bacillus.

Pneumococcal empyema.—This usually follows pneumonia. The pus is yellow, very thick, contains many flakes of lymph, and is so characteristic that it is possible to tell a pneumococcal empyema by the mere inspection of the pus in the great majority of cases. Pneumococci are present in large numbers, and usually in pure culture.

Streptococcal empyema.—In this case the effusion is usually clear or only slightly turbid in the early stages, but gradually becomes thicker and more purulent as the disease progresses. Streptococci are present in long chains. The condition is usually secondary to a streptococcal pneumonia such as that following influenza.

Tuberculous empyema.—The pus in these cases varies from a rather dirty yellow to a greenish-yellow colour. It may resemble pneumococcal pus, but has not the same thick cream-like appearance. Tubercle bacilli are usually present in large numbers, and the fact that no other organisms are found in the majority of tuberculous empyemata suggests that the pus is the result of the tubercle bacilli alone and not of a super-imposed infection by other organisms. The peculiar greenish tint of tuberculous pus is not seen in cases due to pyogenic organisms, and this also is opposed to the view that purulent effusions are due to mixed infections and not to the unaided action of the tubercle bacilli.

L. S. T. BURRELL, M.D., F.R.C.P.,
Physician, Royal Free Hospital and Hospital for Diseases of the Chest, Brompton.

MANCHESTER'S TUBERCULOSIS DISPENSARY.—A writ has been served on the Town Clerk of Manchester, by which a resident seeks to restrain the Corporation from building a new tuberculosis dispensary and offices on a vacant site in Oxford-road opposite the Royal Infirmary.

HOSPITAL PLANNING.—Mr. H. Percy Adams, F.R.I.B.A., last week read a paper before the Royal Institute of British Architects on "English Hospital Planning." He pointed out that the ideal site for a hospital is on high ground and of large area. Fifty beds to the acre, as had been suggested, would be all very well in the country, but impossible in towns. There should be a gentle slope from north to south or south-east, with good approach roads on the northern side. The buildings should be well sheltered by trees or rising ground, a sub-soil of chalk, rock, or gravel was best, and water, gas, and good drainage should be available. The advantage to patients of hospitals outside urban areas would be enormous; the disadvantage would be the slight inconvenience to the medical staff and friends visiting patients.

Special Articles.

MEDICAL CANDIDATES FOR PARLIAMENT.

SUCCESSFUL AND UNSUCCESSFUL.

THE following is a complete list of medical men and women entitled to sit in the new House of Commons. The result of the Scottish Universities poll had not reached us as we went to press:—

Members.	*Constituency.*	*Party*
Rt. Hon. C. Addison ..	Wiltshire (Swindon) ..	Lab.
Dr. Ethel Bentham ..	Islington (East) ..	Lab.
Dr. A. Vernon Davies ..	Lancashire (Royton) ..	C.
Dr. Walter E. Elliot ..	Glasgow (Kelvingrove)	C.
Dr. R. Forgan	Renfrew (West) ..	Lab.
Dr. F. E. Fremantle ..	Hertford (St. Albans) ..	C.
Mr. H. C. Haslam ..	Lincolnshire (Horncastle)	C.
Mr. Somerville Hastings	Reading	Lab.
Dr. J. Hunter	Dumfriesshire	L.
Dr. E. Graham Little ..	London University ..	Ind. C.
Dr. H. B. Morgan ..	Camberwell (North-West)	Lab.
Dr. J. H. Morris-Jones	Denbigh (Denbigh) ..	L.
Dr. Drummond Shiels ..	Edinburgh (East) ..	Lab.
Dr. Alfred Salter	Bermondsey (West) ..	Lab.
Prof. T. Sinclair	Queen's University, Belfast	C.
Dr. G. E. Spero	Fulham (West) ..	Lab.
Dr. J. H. Williams ..	Carmarthen (Llanelly) ..	Lab.

List of Medical Candidates for Parliament.

A list of medical candidates is here given, showing the individual position at the poll, and the number of votes registered. A dagger sign indicates membership of the last House of Commons, while an asterisk indicates that the candidate contested this or some other seat at the last General Election.

Constituency.	Name.	Position at poll.	Votes registered.
Universities.			
London ..	Dr. Graham Little†	1	(1) Ind., 5,869 (2) L., 2,923 (3) C., 2,179
Scottish ..	Sir George Berry†	—	—
	Dr. James Kerr..	—	—
Queen's, Belfast	Prof. T. Sinclair †	U.	
London Boroughs.			
Bermondsey, West	Dr. Alfred Salter†	1	(1) Lab., 13,231 (2) L., 4,865 (3) C., 3,852
Bethnal Green, S.W.	Dr. R. Dunstan*	3	(1) L., 8,109 (2) Lab., 6,849 (3) Com., 1,365 (4) C., 1,365
Camberwell (Dulwich)	Dr. R. C. Cooke-Taylor*	3	(1) C., 15,009 (2) Lab., 9,309 (3) L., 6,442
Camberwell, North-West.	Dr. H. B. Morgan*	1	(1) Lab., 12,213 (2) C., 9,808 (3) L., 5,559
Camberwell (Peckham)	Dr. J. D. Cooke	2	(1) Lab., 15,751 (2) C., 10,246 (3) L., 6,187
Fulham, West ..	Dr. G. E. Spero*	1	(1) Lab., 16,190 (2) C., 13,979 (3) L., 5,920
Islington, East ..	Dr. Ethel Bentham*	1	(1) Lab., 15,199 (2) C., 13,641 (3) L., 11,136
Wandsworth (Balham & Tooting)	Dr. C. W. Brook	2	(1) C., 18,181 (2) Lab., 13,449 (3) L., 8,533
	Dr. W. H. Summerskill	3	
Wandsworth, Central	Sir Henry Jackson†	2	(1) Lab., 11,404 (2) C., 11,104 (3) L., 4,784
English Boroughs.			
Birmingham (Moseley)	Dr. F. G. Bushnell*	2	(1) C., 33,820 (2) Lab., 15,733 (3) L., 9,388 (4) Lab., Left wing, 675.
Derby (2 members)	Sir Richard Luce†	3	(1) Lab., 39,688 (2) Lab., 36,237 (3) C., 24,553 (4) C., 20,443 (5) L., 11,317
Manchester (Withington)	Dr. Joseph Robinson	3	(1) L., 20,948 (2) C., 19,063 (3) Lab., 7,853
	Sir Thos. Watts†	2	
Newcastle-on-Tyne (West)	Dr. J. W. Leech	2	(1) Lab., 16,856 (2) C., 14,088 (3) L., 5,267

Medical Candidates for Parliament—continued.

Constituency.	Name.	Position at poll.	Votes registered.
Oxford	Dr. R. O. Moon*	2	(1) C., 14,638 (2) L., 8,591 (3) Lab., 4,694
Preston (2 members)	Dr. A. B. Howitt	3	(1) Lab., 37,705 (2) L., 31,277 (3) C., 29,110 (4) C., 27,754 (5) Ind., 2,111
Reading	Mr. Somerville Hastings*	1	(1) Lab., 23,281 (2) C., 22,419 (3) L., 7,733
Salford (North)	Dr. L. Haden Guest†	2	(1) Lab., 17,333 (2) C., 13,607 (3) L., 6,609
Scottish Burghs.			
Edinburgh, East	Dr. Drummond Shiels†	1	(1) Lab., 13,933 (2) L., 8,687 (3) C., 6,889
Glasgow (Kelvingrove)	Dr. Walter E. Elliot†	1	(1) C., 17,031 (2) Lab., 15,173 (3) L., 2,623
English Counties.			
Derbyshire (Ilkeston)	Dr. J. V. Shaw ..	2	(1) Lab., 20,202 (2) L., 7,766 (3) C., 6,258
Hampshire (Winchester)	Dr. R. A. Lyster	2	(1) C., 17,560 (2) Lab., 14,326 (3) L., 7,278
Hertford (St. Albans)	Dr. F. E. Fremantle†	1	(1) C., 20,436 (2) Lab., 11,699 (3) L., 10,299
Lancashire (Royton)	Dr. A. Vernon Davies†	1	(1) C., 15,051 (2) L., 13,347 (3) Lab., 10,763
Lincolnshire (Horncastle)	Mr. H. C. Haslam†	1	(1) C., 12,837 (2) L., 10,168 (3) Lab., 3,683
Middlesex (Brentford and Chiswick)	Dr. Stella Churchill*	2	(1) C., 14,025 (2) Lab., 10,978 (3) L., 3,957
Middlesex (Hendon)	Dr. R. Lyons ..	2	(1) C., 31,758 (2) Lab., 15,434 (3) L., 13,449
Wiltshire (Swindon)	Rt. Hon. C. Addison*	1	(1) Lab., 16,885 (2) C., 14,724 (3) L., 7,060
Welsh Counties.			
Carmarthen (Llanelly)	Dr. J. H. Williams†	1	(1) Lab., 28,595 (2) L., 15,065 (3) C., 3,969
Denbigh (Denbigh)	Dr. J. H. Morris-Jones	1	(1) L., 21,305 (2) C., 13,116
Scottish Counties.			
Dumfriesshire ..	Dr. J. Hunter ..	1	(1) L., 16,174 (2) C., 12,984 (3) Lab., 6,687
Linlithgow ..	Dr. John Fraser Orr	3	(1) Lab., 18,063 (2) C., 11,241 (3) L., 5,722
Renfrew, West	Dr. R. Forgan ..	1	(1) Lab., 14,419 (2) C., 12,183 (3) L., 2,682 (4) Scot. Nat. 1,667

C., Conservative. L. Liberal. Lab. Labour. Com., Communist. Ind., Independent. U., Unopposed.

MEDICINE AND THE LAW.

Charge of Unauthorised Reception of Lunatics.

PROCEEDINGS taken at the South-Western police-court against two defendants charged with receiving five lunatics into their nursing-home at Clapham Common, not being licensed so to do, ended on May 30th in the dismissal of the summonses. The case had apparently arisen as the result of the operation of the Nursing Homes Registration Act. If an offence was to be established under the Lunacy Act, it was necessary to prove that the patients at the nursing-home were lunatics. Dr. Worth, medical superintendent of the Springfield Mental Hospital, Tooting, expressed the opinion that the five patients were certifiable, though the magistrate took the view that the opinion had not been given without hesitation. A second witness for the prosecution was Dr. Guy Foster Barham, medical superintendent at the London County Mental Hospital, Claybury, Essex; he confirmed Dr. Worth's opinion, but, under cross-examination, stated that with the exception of one patient, in whose case there was a possibility of suicide, he saw no evidence that the patients were dangerous to themselves or others. For the defence the medical attendants of the five patients were called; they denied that the cases were certifiable or that there was any occasion for placing the patients under restraint. One patient, it was stated, was an old lady of 89, suffering from senile decay, who had been sent to the nursing-home to be looked after. Mrs. Gowan, one of the defendants, said the patients were principally elderly people; all were attended by their private doctors. Sir Robert Armstrong-Jones, she said, had visited her establishment for the Master in Lunacy, and had certified none of the patients. A representative of the Director of Public Prosecutions sought to support the charge by contending that two mental experts had declared the patients certifiable, while the three witnesses who took the opposite view were general practitioners not necessarily experts in mental disease. The magistrate, however, preferred the opinion of the witnesses for the defence. Though not mental experts, they were, he said, qualified to express an opinion; they saw the patients frequently, whereas Dr. Worth had seen them only once. And so, with a comment from the magistrate that the legal definition of a lunatic was somewhat nebulous and with an expression of his surprise that the proceedings should have been deemed necessary, the case came to an end. It would appear unlikely that a magistrate would convict the proprietors of a nursing-home upon a charge of this kind under the Lunacy Act if there were any reasonable doubt of the patients being certifiable. It is common knowledge that there are few matters of medical opinion on which witnesses are found to be so far from unanimity.

Plea of Dual Personality.

In two recent cases lately it has been suggested for the defence that the accused was suffering from a dissociated mind, a form of neurosis which in its higher degree is sometimes described as dual personality. As usual, this has caused a reference in court to Stevenson's story of Dr. Jekyll and Mr. Hyde, as though Stevenson was a mental expert and his tale a case of actual observation. In one of the recent cases the magistrate asked the natural question whether the plea was put forward as a defence to the charge or as an appeal for mitigation of sentence. This is a question to which the legal advisers of the accused must always address themselves; the answer depends upon the expert witnesses' evidence. In that particular case the accused was committed for trial to the sessions, the magistrate being disinclined to decide the issue of insanity. In the other case, the plea of dissociated mind was not supported by the opinion of the senior medical officer of Brixton Prison, where there had been opportunity of observing the accused. The accused had pleaded "guilty" to charges of forgery and false pretences; the suggestion of dual personality was therefore not an attempted defence but an appeal for lessened punishment. Sentence was passed by the Recorder at the Central Criminal Court of three years' penal servitude.

Pharmaceutical Society's Prosecution.

The statutory penalty of £5 (with costs) was imposed last week in the Bow County Court upon a Walthamstow chemist for not having on a specified date conspicuously exhibited on his premises his certificate of registration. An inspector of the Pharmaceutical Society gave evidence of having purchased a disinfectant containing poison at the defendant's shop. The defendant was not on the premises and (as was admitted at a subsequent visit) his certificate was not exhibited. Judge Owen Thompson, K.C., in imposing the penalty, remarked that he had often wondered what was the motive—whether pride or otherwise—which impelled the display of the Pharmaceutical Society's Certificate. The observation seems to convict the learned judge of judicial ignorance of the Pharmacy Act, 1868, and the Poisons and Pharmacy Act, 1908. Where Parliament prescribes or recognises the grant of professional qualifications by some supervisory body, it is clearly to the public interest that there should be means of knowing whether a practitioner possesses the qualification or not.

INTER-STATE POST-GRADUATE ASSEMBLY OF NORTH AMERICA.

VISIT TO LONDON, MAY 27TH–29TH, 1929.

(Concluded from p. 1165.)

THE session of this assembly ended in London on May 29th. In the morning Sir W. **Arbuthnot Lane**, who took the chair, spoke on

Intestinal Stasis.

He said that any laborious occupation pursued for a long time resulted in such definite and characteristic changes in the bones and joints of the body that the labour-history of the subject could easily be identified. Six fundamental laws could be enunciated: (1) The skeleton represented the crystallisation of lines of force. (2) Pressure produced changes in the skeleton, altering the form of bones and joints, destroying normal ones and developing new ones, and changing hyaline cartilage into bone. (3) Strain had the same effect as pressure. (4) When it was of advantage to the individual, an old mechanism might be altered and a new one developed. (5) We bore a simple mechanical relationship to our surroundings, and any change in that relationship had associated with it a corresponding change in anatomy. (6) To this there was the solemn corollary that any change which ensued to meet altered relationships to surroundings tended to shorten life. As a result of formulating these laws, the speaker had started operating on simple fractures and on cleft palate in infants, and the application of the laws to the gastro-intestinal tract had revealed certain remarkable changes. Robust primitive races, living almost entirely on the fruits of the soil and dairy produce, had an action of the bowel after each meal, and this normal functioning excluded the incidence of all the familiar diseases of civilisation. The milk of the civilised mother was usually wanting in necessary components, so that material was delayed in the intestine, and evacuations were infrequent and irregular. In any case the child was soon taught only to have one action a day. In consequence a portion of the large bowel, which for thousands of years had been evolved to contain a quantity of the products of digestion proportionate to the intake, now had to deal with 24 hours' accumulation. To prevent enormous elongation and distension the bowel had become fixed by a series of ligamentous bands in the lines of strain. These were developed early in life, and had been described as congenital. Fixation led to obstruction, and obstruction to inflammation and spasmodic muscular action which further increased the obstruction, which was gradually transmitted back to the cæcum, small intestine, and duodenum, so that the duodenal mucosa was overstretched, bled readily, and ulcerated. To obviate this the pylorus contracted spasmodically, and the stomach became dilated and lost its pumping efficiency. The overloading of the stomach caused ulceration. When ulceration and irritation became chronic, carcinoma frequently supervened. Organisms thrived in the material accumulated in the bowel, and toxic products entered the circulation, causing malnutrition and degeneration of all the tissues of the body, disease, and lower resistance to other organisms. Cancer never affected a healthy organ. Sir Arbuthnot Lane then showed a number of slides illustrating the skeletal changes produced by various occupations, and the "first and last kink" as the cause of all the diseases peculiar to civilisation, more properly called "filth diseases," for they never affected people with a normal drainage system. He thought that the present relationship between doctor and patient was all wrong; the physician should watch his patient regularly, and follow him "from the cradle to the grave."

Dr. **Donald Hunter** spoke on the

Clinical Significance of the Suprarenal Cortex.

He quoted Addison's original paper, describing two important discoveries, "Addison's disease" and "Addisonian anæmia," reviewed the history of research on the suprarenals, and described a number of cases showing the functions of the suprarenal cortex. Tuberculous disease had only been found in 20 out of 28 cases of Addison's disease in the London Hospital during the last 20 years. In eight of them the only lesion had been atrophy of the cortex. The organs included under the "chromaffin system" all belonged to the same system, embryologically, chemically, and physiologically. The medulla of the suprarenal was not essential to life, but only to the emergency mechanism of reaction to danger. Cannon had gradually removed the entire sympathetic system from a cat, and when this animal was confronted with a dog no reaction occurred. The cortex, on the other hand, was essential to life. Accessory suprarenals usually consisted of cortex only. Investigators seemed to be on the verge of discovering the hormone of the cortex; this would probably keep patients of Addison's disease alive. Simple adenomata of the cortex were harmless and symptomless; carcinoma was usually a true hypernephroma giving the signs of renal tumour. Dr. Hunter then recounted cases of sexual precocity associated with tumour of the suprarenal cortex; he said that the condition was commoner in girls, the precocity being of a male type. In one case the growth of secondary deposits had been associated with very marked advance of the sexual precocity.

Mr. **Donald Armour** spoke on

Head Injuries.

He reviewed the anatomical relationships governing the spread of infection and hæmorrhage in the scalp. Were there no emissary veins, infections of the scalp would be much less serious. No wound of the scalp was unimportant; hæmostasis, cleansing, and closure with drainage, under anæsthesia, should be promptly undertaken. No cosmetic consideration should prevent the shaving of a wide area. The site of injury should then be thoroughly scrubbed with a nailbrush, soap and water, and every particle of foreign matter removed, the wound being enlarged if necessary. Careful search for bone injury should be made in a good light. The wound should be dressed daily for the first few days and watch kept for signs of deep infection. If large vessels had been cut, a curved needle should be passed under them, and they could then be secured easily. Any fracture discovered at operation should be followed along its entire length, and the wound should be regarded with suspicion for a few days. If a fissured fracture were found, wider implication of the inner table was probable, especially if blood continued to ooze, and if foreign matter were caught in it. Fractures should not be examined by probe, but opened up with chisel and mallet, the chisel being held almost parallel with the skull, and the inner table investigated. If it were comminuted all fragments must be carefully removed, the dura being cautiously separated. If the dura were torn, a mess of bone fragments, blood-clot, and brain tissue would be found at the bottom of the fracture; it was best cleared up by irrigation or with tiny swabs, used with great caution and delicacy. A bleeding cortical vessel was best tied by passing under it a suture carrying a ligature. Sudden hæmorrhage might follow removal of bone fragments. Oozing from diploic veins was easily stopped with bone wax, or by crushing the two layers of bone together at the edge. A ruptured meningeal vessel should be underpinned, like a cortical vessel: bleeding at the cut edge of the dura could be stopped by crushing or by ligature. Most difficult of all to stop was bleeding from a torn sinus; sometimes the tear could be closed by suture, or a piece of muscle might be put over it. When the exact site was not ascertainable a gauze plug might have to be used. When the depressed bone could not be removed without injury to the brain because of high cerebral tension, a subtemporal decompression should be performed first. Sometimes a trephine opening would provide access to a depressed piece of bone.

The danger of fracture in a head injury was often exaggerated at the expense of the functional damage done to deeper structures. Thus the importance of "minor" head injuries was under-estimated. Increase in intracranial pressure was the first result, due to œdema or hæmorrhage or both, and might be increased later by blockage, which set up a vicious circle by displacing the midbrain. The pressure was exerted on the blood-vessels and caused focal or general neurological symptoms. "Concussion" was a term with varied interpretations. It was more than a temporary functional disturbance. Post-concussion neurosis was a result of the change, usually a rise in tension. Under violence there was a change of shape, a flattening, which drove out cerebro-spinal fluid. Any fluid that could not get out must pass into the perivascular spaces and this, acting on the ganglionic cells, had been held to account for the phenomena of concussion. French workers had evolved a "formula of concussion" (of cerebro-spinal tension) which they applied even in the absence of any history of injury. The determination of pressure of the fluid was, therefore, of great importance in acute or chronic head injury, and must be made with a manometer. The absence of blood in the fluid did not exclude intracranial hæmorrhage, and had no significance in treatment. Papillœdema or papillary stasis might be produced by increased tension, and ophthalmoscopic observation of dilatation of the retinal arteries and venous stasis was of great value. After six hours of increased tension blurring of the disc appeared, and was more marked in tentorial injuries. The therapeutic value of lumbar puncture was insufficiently appreciated; it often allowed decompression to be postponed until conditions were suitable or obviated it altogether. The pressure and not the quantity withdrawn was the determining factor. Repeated puncture mitigated the distressing symptoms of restlessness, headache, vertigo, and irritability in less serious cases. Intravenous hypertonic solutions were useful for lowering intracranial tension—e.g., 50 c.cm. of 30 per cent. sodium chloride or 100 per cent. dextrose. Half an ounce of saturated magnesium sulphate by the mouth, hourly, or 30 per cent. sodium chloride per rectum might be used. In the intermediate group, between mild and severe injuries, only careful observation could decide whether decompression was advisable or not. No operation whatever should be performed while the patient was in a state of shock, nor should the surgeon intervene in the very severe cases of medullary collapse which could not recover anyhow. The ideal period was the stage of capillary anæmia, shown by slow pulse and slight rise in arterial blood pressure, before increasing headache and delirium indicated venous stasis. The operation was a right subtemporal decompression.

Corrigendum.—Dr. H. C. Semon writes that he did not intend to suggest (THE LANCET, June 1st, p. 1161) that in treatment with ultra-violet light "the patient was the best judge of overdosage." His actual words were: "The effects of overdosage are so immediate that the patient himself is the best security against them, and there are no real dangers, *qua* skin such as apply in X ray therapy."

DONCASTER ROYAL INFIRMARY.—The Doncaster Collieries Association has given a second instalment of £10,000 promised towards the cost of the new Doncaster Royal Infirmary.

GENERAL MEDICAL COUNCIL.

SUMMER SESSION, 1929.

PENAL CASES.

TUESDAY, MAY 28TH.

ACCORDING to custom the Council heard the cases in public but deliberated upon them in camera, and the President announced the decisions.

Reported by the Dental Board.

The Case of Harry Patrick Jones, registered as of 4, Aberford-road, Woodlesford, Yorks, "Dentist, 1921," who had been summoned to appear before the Council as the result of the finding of the Dental Board that his name ought to be erased from the Dentists Register in consequence of his having canvassed for the purpose of procuring patients and of his having employed a canvasser for a similar purpose. The complainants were the Public Dental Service Association. This case had been adjourned from May 28th, 1928, when the respondent had appeared before the Council and judgment had been postponed for twelve months.

The Dental Board reported that Mr. Jones had not attended the inquiry on May 8th of this year, but had sent a letter from Wakefield Prison asking for an adjournment. He had been convicted at the Leeds Assizes commencing on March 4th, 1929, of the following misdemeanour and felony, viz: (1) Of fraudulently converting on Dec. 8th, 1928, at Leeds, a banker's cheque for the sum of £100 entrusted to him for the purchase of shares by Sarah Helen Williamson, and (2) of bigamously marrying Dulcie Mona Morgan on Dec. 22nd, 1928, at Manchester, and had been sentenced to six months' imprisonment in the second division upon each indictment, the sentences to run concurrently.

The Board, therefore, recommended that the respondent's name be erased from the Dental Register. The Council decided that it should be so erased on each of the two counts, for canvassing and for conviction of a felony.

Adjourned from May, 1928.

The Case of Reginald Francis Edmund Austin, registered as of 41, Wimpole-street, W.1, M.R.C.S.Eng. 1891, L.R.C.P.Lond. 1891, who had appeared before the Council on the following charge:—

> "That, being a registered medical practitioner, you have sought to attract to yourself patients and to promote your own professional advantage by means of an article upon appendicitis written by you and published in the number for December, 1927, of the magazine *Health and Efficiency*, in which you extolled your own methods and depreciated those of other practitioners; and that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect."

The complainants were the Medical Defence Union.

After considering a number of testimonials furnished by Dr. Austin, and hearing his own assurances for the future, the Council decided not to erase his name from the Register.

Charges Concerning Advertisement.

The Case of Elizabeth Caroline Mudie, registered as of 3, Windsor-quadrant, Kelvinside, Glasgow, W., L.R.C.P. Edin. 1925, L.R.C.S. Edin. 1925, L.R.F.P.S. Glasg. 1925, who had been summoned to appear before the Council on the following charge:—

> "That, being a registered medical practitioner; (1) you have associated yourself with and/or been employed by a Company, namely, Ultra-Violet Rays (Glasgow), Limited (of which you are also part proprietor), which advertises for the purpose of obtaining patients: (*a*) By means of an advertisement in the *Glasgow Herald* of Jan. 21st, 1929; and (*b*) by means of a printed pamphlet entitled Ancient Sun Worship, indicating and recommending the methods of treatment employed by the said Company; (2) you have acquiesced in the publication of such advertisements for the purpose of obtaining patients to your own professional advantage. And that in relation to the facts so alleged you have been guilty of infamous or disgraceful conduct in a professional respect."

The complainants were the Medical Defence Union.

Dr. Mudie appeared, and was represented by Mr. T. Carthew, counsel.

Mr. Oswald Hempson, in opening the case for the complainants, said that Dr. Mudie had associated herself for her own ends with a company in which she was a large shareholder. The attention of the Medical Defence Union had been called to an advertisement in the *Glasgow Herald*, announcing that the Directors of "Ultra-Violet Rays (Glasgow), Limited," had acquired certain premises which had been fitted up for intensive treatment of disease by ultra-violet ray therapy, and that the whole-time services of an experienced physician had been secured. The Union had ascertained that Dr. Mudie was the physician referred to; that the company had been registered in January of this year and that Dr. Mudie held 350 out of a total of 701 shares. One of the objects of the company, as stated in its memorandum, was "to adopt such means of making known the business of the company as may seem expedient, and in particular by advertising in the press or by circulars." Miss Jessie Watson Gordon, who had consulted the respondent under instructions from the Union's Glasgow agents, had deposed that respondent had said "When I started this company I had to get a name for it, and as it was really ultra-violet rays I could not get a better name." This intimated that Dr. Mudie had been the originator of the company. She could not have been ignorant of the objects for which it was formed, as set out in the memorandum and articles of association, nor of the advertisement in the *Glasgow Herald*. The address of the institute given in the pamphlet on Ancient Sun Worship was that of Dr. Mudie's consulting room, outside which her name appeared. The pamphlet itself was of the type which was got up solely for the attraction of the layman; it suggested an ancient origin for the treatment and covered it with an air of mystery, and gave a list of diseases which the treatment was alleged to cure.

Miss Jessie Gordon testified to her statutory declaration. She was a typist in the employ of the Glasgow agents of the Medical Defence Union, and had written and sent by their instructions a letter saying that she was suffering from debility, that she would like to receive particulars, and that she was prepared to call at the home. An appointment was fixed by a letter written by Dr. Mudie in the third person, and subsequently by telephone with her. When witness went to the address given, she found a brass plate with Dr. Mudie's name and nothing else. A nurse had received her, and had said that Dr. Mudie had telephoned instructions to give witness a sun-bath. Dr. Mudie had then arrived and interviewed the witness, saying she was very much in need of the treatment and that it would make a new girl of her and would do instead of a holiday. She had asked how witness had heard of the company; witness had said she had heard of it from a friend who had had ultra-violet treatment, and gave her the name of a "Miss Gavin." Dr. Mudie had replied that she had had a patient of that name some time ago. Dr. Mudie had then explained the name of the company. She had offered to give witness a letter to her insurance society, saying that if they would not pay she could change her society.

Cross-examined, witness said she had made notes of the conversation on her way home and had drafted the statutory declaration that night. The symptoms she had related to Dr. Mudie were in fact correct, as she had recently had an operation for the removal of tonsils. She maintained that her declaration was a perfectly accurate report.

Dr. Mudie, called on her own behalf, stated that she had been interested in ultra-violet ray therapy since 1912, but had had to work for several years in order to pay for her medical studies. She had qualified in 1925, and had studied the effects of light treatment on the patients she had sent to the hospitals which gave it, but had not been able to afford the apparatus. She had acquired a good nucleus in her first year of practice, but had been badly handicapped by the strike. She had been very desirous of undertaking research in actinotherapy, and had begun to specialise in it. She had met a Mr. Woodside, who had also been interested and had possessed capital, and her solicitor had advised them to form a company. She herself had no business experience, but had consulted the secretary of the Local Panel Committee; he had told her that there could be no objection provided that she was not a director. The company had been incorporated in January of this year. Mr. Woodside was managing director and secretary, and a Mrs. Walker was the other director pro forma, holding only a single share. The company was to acquire apparatus to the value of £350, provided by Mr. Woodside and credited to witness in one-pound shares. She was to receive £500 per annum, and board and lodging, and Mr. Woodside £350 per annum, but they had not drawn any of this. She had never seen the memorandum and articles of association, but had left the arrangements entirely in the hands of her solicitor. She had always had the plate on the door, and had not thought to alter it. A clinic had been started at another address. Mr. Woodside had drawn up and inserted the advertisement in the *Herald* without consulting her. The data for the pamphlet on "Ancient Sun Worship" had been some notes of a lecture she had delivered to a local society. She had not thought there was anything wrong in having it printed and in her consulting-room. Miss Gordon's letter had come to her private address by mistake. She denied having telephoned instructions to give Miss Gordon a sun-bath. The remark about the name of the company attributed to her was an absolute fiction. She had never had a patient named Miss Gavin. No patient, apart from Miss Gordon, had come as a result of the advertisement in the *Glasgow Herald*.

Cross-examined, witness said that she had asked how Miss Gordon had come for treatment, not how she had heard of the company. She did not open letters addressed to the company at the registered office, but Miss Gordon's letter had come to her by accident. She had not noticed that it was addressed to the company. She maintained that she had an accurate recollection of the conversation with Miss Gordon. She denied having discussed the name of the company with Miss Gordon. She had seen the circular in draft and approved of it; it was to be used for the people who had been to the clinic. She did not think there was anything unprofessional about it. She now admitted that her conduct in giving the directors a free hand had been unwise. She had never seen the advertisement until the morning when the warning notice arrived. The matter of profits had never entered her head. Although the articles of association provided for treatment by Mr. Woodside of male patients, and did not stipulate for her personal supervision, she actually supervised all treatments.

In answer to the Legal Assessor, witness said that the object of the company was to relieve her of the business side of the work and enable her to do research in the intervals of practice, but admitted that the expenses had to be derived from the work. She maintained that patients were to have been obtained through the ordinary ethical channels. She had never inquired whether any of the circulars had been posted or left, or whether advertisements had been inserted in the Press. She had never looked at the register of patients, but knew it was used for making accounts with patients and giving receipts. On examining the register she declared that she could account for all the patients shown in it. Mr. Woodside's capital was to have gone to found the new clinic. She had been prepared to wait for her salary until matters improved, and Mr. Woodside had so far not received any of his salary. She had expected to obtain sufficient patients to cover all the outgoings.

In answer to the President, witness admitted that a passage in the circular relating to unqualified practitioners did not come from the notes of her lecture. She again pleaded ignorance of the article in the memorandum relating to treatment by Mr. Woodside. It was true that the circular might attract patients to go to the witness's house where they would meet witness and nobody else, and that she would then take charge of them. She had taken the Council's letter to Mr. Woodside and he had shown her the proof of the advertisement. She had then expressed her regret that it had been inserted. She had not originated the company, but had acted on the advice of the secretary to the local panel committee, a solicitor. She had not, however, shown him the articles of association. He had said that she could act as medical advisor if she kept off the directorate. She had had nothing to do with the allotment of shares, but had followed the dispositions of her legal adviser. She had thought of nothing but of going on with her work.

Mr. John D. Woodside testified that he had acted as doctor's assistant in two hospitals. He had been anxious to go into practice. He had been introduced to Dr. Mudie, who had told him of her desire to carry out research in ultra-violet therapy and that she needed extra plant. The company was formed with this object. He had carried on the business side of the company, and Dr. Mudie had had nothing to do with this department. He sent out accounts to patients. Some patients, who required only one or two treatments, paid cash, and their names did not appear in the receipt-book. The money he had brought into the company had been devoted to buying apparatus and developing the clinic. The articles of association, when drawn up, had been sent to him and Dr. Mudie had not seen them. The order for the insertion of the advertisement had been given by witness, and Dr. Mudie, as far as he knew, had not been aware of it. He had not told her, as she had nothing to do with the administration side of the business. In answer to the President, witness said that he had known that doctors were liable to limitations, but had not been acquainted with the full regulations. Dr. Mudie had been only the medical advisor, although he admitted that all the profits were derived from her. He had himself prepared the circular, from some notes and a list of treatments supplied by Dr. Mudie.

Cross-examined, Mr. Woodside said that the advertisement had not necessarily been inserted for the purpose of attracting patients, but to announce the formation of the company; he admitted, nevertheless, that he expected some return from it. He had circularised, on his own account, persons who had been patients and who might become patients. Asked whether he had not realised that, from the professional standpoint, he had been doing a very heinous thing *in sending out these advertisements*, he replied "Yes, and no." He did not suggest that he had any doubts about which he could take advice; he knew that the course was professionally heinous, but had not realised that there was any danger. In answer to the President, he admitted having decided to take the risk without consulting Dr. Mudie. She had given him the list of indications for treatment—mentioned in the circular—at his request; he could not remember whether he had told her that he had required it for this purpose. He admitted to the President that he had prepared the circular with the object of increasing the business of the company.

Examined by the Legal Assessor, he declared that no patients had come in response to the advertisements or circular. He admitted, in answer to a question put from the chair, that the company consisted in practice entirely of himself and Dr. Mudie.

Addressing the Council on behalf of the respondent, Mr. Carthew pointed out that, while technically Dr. Mudie's ignorance of Mr. Woodside's proceedings might not exonerate her, it must necessarily carry much weight. She had taken the precaution of consulting the secretary of the local panel committee and her own solicitor; possibly inadequate precautions, but they had seemed adequate to her. Few women took any interest in articles of association, and when she said she had accepted her solicitor's word that they were suitable she was telling the truth. The advertisements had been issued without her knowledge, and her fault if any had lain in lack of precaution. Her attitude throughout had been "Let me get on with my work, and you look after the business side." This attitude was reflected in the articles of agreement, and in the circular itself. That Dr. Mudie's name still appeared outside the premises where patients of the company were directed to come was a mere oversight. Any fault was a fault of carelessness, and not of deliberate wrongdoing.

Mr. Hempson remarked that there was a degree of blindness and acquiescence which was culpable. Dr. Mudie had known of the warning notices and of the feeling of the profession about advertising. She knew that commercial methods generally included advertising, but had instituted no safeguards of any kind. The fact that no patients had resulted from the advertising was not material to the charge.

The Council found that the facts alleged against the respondent had been proved to their satisfaction, but suspended judgment until their next summer session subject to the usual provisos.

WEDNESDAY, MAY 29TH.

The Case of Haydn Brown, registered as of 53, Bedford-square, London, W.C.1, L.R.C.P. Edin. 1892, L.R.C.S.Edin. 1892, who had been summoned to appear before the Council on the following charge:—

> "That, being a registered medical practitioner, you have associated with and/or acquiesced in the publication of announcements in the *Daily Record and Mail* of Glasgow of Jan. 11th, 16th, and 21st, 1929, for the purpose of obtaining patients with a view to promoting your own professional advantage. And that in relation to the facts so alleged you have been guilty of infamous or disgraceful conduct in a professional respect."

The complainants were the Medical Defence Union.

The respondent was represented by Mr. W. Frampton, counsel. Mr. Hempson said that Dr. Brown was not a young man and had had several years' experience of medicine, for he had qualified in 1892. He could not therefore plead ignorance. The case was a peculiarly flagrant one. The attention of the Union had been called to three articles in the *Daily Record* of Glasgow. This journal had been conducting a campaign to interest its readers in the cure of asthma. It had given an account of a dinner held at the Mansion House to inaugurate the Asthma Research Committee, and had published a letter from the four eminent physicians who were sponsoring the committee to the public. Meanwhile, the article ran, a certain cure for asthma had been discovered by a London doctor, who had offered to treat Scottish sufferers free.

The article gave an account of his method, which was known as Autonomous Relaxation. The editor of the *Daily Record* had forwarded to Dr. Brown large numbers of letters from persons in Scotland suffering from asthma. He had treated some of these, and the newspaper had then published enthusiastic accounts from them of the success of the treatment. Dr. Brown had subscribed to a press-cutting agency, and therefore must have known the type of articles which were appearing. A further article contrasted the opinion of the four specialists with the cures that were claimed for the respondent's method. In a subsequent issue, a long article appeared written or authorised by Dr. Brown giving an account of his method and his treatment of the patients with whom the *Daily Record* had put him in touch. The fact that his actual name never appeared did not make his conduct less reprehensible.

Mr. Hempson had instructed his clerk to communicate with Dr. Brown as a patient. A reply was received from the newspaper syndicate in acknowledgement, and subsequently two letters were received from Dr. Brown, making an appointment and informing the applicant that the fee was three guineas. The clerk had attended Dr. Brown's consulting-room, and had received a short treatment, which had not benefited him. The clerk had then written another

Dr. Mudie appeared, and was represented by Mr. T. Carthew, counsel.

Mr. Oswald Hempson, in opening the case for the complainants, said that Dr. Mudie had associated herself for her own ends with a company in which she was a large shareholder. The attention of the Medical Defence Union had been called to an advertisement in the *Glasgow Herald*, announcing that the Directors of "Ultra-Violet Rays (Glasgow), Limited," had acquired certain premises which had been fitted up for intensive treatment of disease by ultra-violet ray therapy, and that the whole-time services of an experienced physician had been secured. The Union had ascertained that Dr. Mudie was the physician referred to; that the company had been registered in January of this year and that Dr. Mudie held 350 out of a total of 701 shares. One of the objects of the company, as stated in its memorandum, was "to adopt such means of making known the business of the company as may seem expedient, and in particular by advertising in the press or by circulars." Miss Jessie Watson Gordon, who had consulted the respondent under instructions from the Union's Glasgow agents, had deposed that respondent had said "When I started this company I had to get a name for it, and as it was really ultra-violet rays I could not get a better name." This intimated that Dr. Mudie had been the originator of the company. She could not have been ignorant of the objects for which it was formed, as set out in the memorandum and articles of association, nor of the advertisement in the *Glasgow Herald*. The address of the institute given in the pamphlet on Ancient Sun Worship was that of Dr. Mudie's consulting room, outside which her name appeared. The pamphlet itself was of the type which was got up solely for the attraction of the layman; it suggested an ancient origin for the treatment and covered it with an air of mystery, and gave a list of diseases which the treatment was alleged to cure.

Miss Jessie Gordon testified to her statutory declaration. She was a typist in the employ of the Glasgow agents of the Medical Defence Union, and had written and sent by their instructions a letter saying that she was suffering from debility, that she would like to receive particulars, and that she was prepared to call at the home. An appointment was fixed by a letter written by Dr. Mudie in the third person, and subsequently by telephone with her. When witness went to the address given, she found a brass plate with Dr. Mudie's name and nothing else. A nurse had received her, and had said that Dr. Mudie had telephoned instructions to give witness a sun-bath. Dr. Mudie had then arrived and interviewed the witness, saying she was very much in need of the treatment and that it would make a new girl of her and would do instead of a holiday. She had asked how witness had heard of the company; witness had said she had heard of it from a friend who had had ultra-violet treatment, and gave her the name of a "Miss Gavin." Dr. Mudie had replied that she had had a patient of that name some time ago. Dr. Mudie had then explained the name of the company. She had offered to give witness a letter to her insurance society, saying that if they would not pay she could change her society.

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In answer to the Legal Assessor, witness said that the object of the company was to relieve her of the business side of the work and enable her to do research in the intervals of practice, but admitted that the expenses had to be derived from the work. She maintained that patients were to have been obtained through the ordinary ethical channels. She had never inquired whether any of the circulars had been posted or left, or whether advertisements had been inserted in the Press. She had never looked at the register of patients, but knew it was used for making accounts with patients and giving receipts. On examining the register she declared that she could account for all the patients shown in it. Mr. Woodside's capital was to have gone to found the new clinic. She had been prepared to wait for her salary until matters improved, and Mr. Woodside had so far not received any of his salary. She had expected to obtain sufficient patients to cover all the outgoings.

In answer to the President, witness admitted that a passage in the circular relating to unqualified practitioners did not come from the notes of her lecture. She again pleaded ignorance of the article card submitted to him before it was issued and had approved it, as he had seen the brochures issued by other firms and saw nothing objectionable in it. He had nothing to do with the card index, though he had seen it since this inquiry had begun. No distinction had been made between different classes of inquirers and patients. 60 to 70 per cent. had been introduced by their ordinary medical advisers; 217 doctors were associated in various ways with the Institute. Most of the remainder came into touch through personal recommendation. All patients were treated under the witness's own supervision. One of his objects in joining the Institute had been to spread knowledge of the treatment inside the profession. There was a society with a journal. There was a separate company for supplying drugs and apparatus with which witness had nothing whatever to do; it had been housed elsewhere at his insistent request. In answer to the President, he admitted that the two concerns had some common members. If the Council considered after inquiry that he ought to sever his connexion with the Institute, he would do so at once. He had, in fact, already tendered his resignation, but it had not been accepted, since the chief director had not yet returned from abroad.

In reply to cross-examination, the witness maintained that he saw nothing wrong in sending out the cards, in so far as they had been sent to patients and inquirers. He would not have sanctioned the issue of cards to such ancient inquirers as Mr. Coulson. The sending of Mr. Coulson's card had, he admitted, been improper. It had not occurred to him to admit this in his reply to the Council's warning notice. It had been on this account that he had tendered his resignation. He could not explain the presence of several cards in the index with no entries on them but addresses and numbers. When an inquiry came in, a card was made out with the name and address and filed away; any answers were recorded on the appropriate card. He did not, however, keep this index. No stereotyped letters were ever sent out. Asked why, if the cards had been intended for patients and inquirers, the points of the change of staff and reduction of fees had not been stressed, and why it should be necessary to include details such as the date of foundation, he replied that he had not gone into these questions when the cards had been produced. The only question raised had been whether it was right to send them out, and he had glanced through the draft and said "Yes." He had always understood that it was in order to notify private patients of change of address or the acquisition of a practice, but not to give the fees or describe the treatment. He did not regard an inquirer as a patient, or entitled to notification of change of practice. Many physicians in charge of reputable institutes sent new particulars to former inquirers; he was not in a position to say whether or not this was proper. He agreed that it had been improper to send the card to Mr. Coulson, but could draw no time limit after which an inquirer became "ancient." He had not realised the risk of cards going out broadcast; this would have been grossly unprofessional. He was not a business man, and it had never come to his notice that the Institute's articles allowed it large powers of advertising. The Institute made no profits and probably never would; it had been started from philanthropic motives. The object of such publicity as there had been was to establish the venture inside the profession and if possible to make it self-supporting. Publicity to the Institute could, of course, hardly help benefiting the company providing apparatus.

He had thought Miss Ash's inquiry a perfectly genuine one and had not remarked that she had not given the name of anyone as recommending the Institute to her. It was not always done. It had never occurred to him that she had received the notification from an improper source; it might well have reached her from a doctor. The safeguards against advertising had been the verbal undertakings of the other directors when he had joined the Institute. He had not inquired into what had happened before he had joined. He had, however, not had his stipulation recorded in the minutes. Apparently the precautions he had taken had not been sufficient in the case of Mr. Coulson, but the error might have been avoided with a little vigilance. In answer to the President, he said that the company had lost something under £2000 in the last completed year. Mr. Hamilton had neither made any profits nor done anything but put money in. Major Collison only countersigned cheques. To the Legal Assessor, he admitted never having taken pains to ascertain the objects of the company of which he was a director, or whether it was registered. Questioned on items of £1600 and £199 for development expenses in the balance-sheet, he said they must have been expended on legitimate advertising, but did not know what form that took.

The Legal Assessor read an extract from the memorandum of the company mentioning as one of its objects—

> "To adopt such means of making known the products of the company as may seem expedient, and in particular by advertising in the press, by circulars, by purchase and exhibition of works of art or interest, by publication of books and periodicals, and by giving prizes, awards and donations."

The witness observed that if he had known of this he would never have sanctioned it. He had refrained from inquiry because of his complete confidence in his fellow directors. The concern had been incorporated as a limited company to limit Mr. Hamilton's liability.

Major W. E. Collison testified that no advertising had been done in other than medical journals. The treatment had been invented in Germany, and the physician in charge had been a German. The index cards, of which Mr. Coulson's had been one, had been taken over when the present company had been formed. They had never been used before the reorganisation, and there had been no follow-up system. When the fees had been reduced, Dr. Corbet had instructed the clerk to send out notices to inquirers.

Cross-examined, he was uncertain whether respondent or himself had given those instructions. One to two thousand cards had been issued. A certain amount of advertising and circularising had been done in the days of the German physician.

The Council found the charges proved to their satisfaction, but postponed judgment for a year, subject to the usual provisos.

THURSDAY, MAY 30TH.

Alleged Canvassing for Patients.

The Case of Jacob Lenten, registered as of 124, Station-road, Hadfield, Manchester, L., L.M. 1926, R.C.P.Irel., L., L.M. 1926, R.C.S. Irel., who appeared before the Council on the following charge:—

> "That, being a registered medical practitioner, you have canvassed for the purpose of procuring patients for yourself, and in particular (1) in or about December, 1928, canvassed one, James Henry Taylor, and (2) in or about December, 1928, canvassed one, John Robinson, panel patients of the late Andrew Paterson Walker for whom you had acted as locum tenens. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect."

The complainants were Mrs. Walker and Mr. J. W. Struthers, M.B. They were represented by Mr. H. E. Kingdon, counsel, and the respondent was accompanied by Mr. J. Lustgarten, counsel.

In opening the case, Mr. Kingdon related that on Nov. 7th, 1928, the respondent had acted as locum tenens to Dr. Andrew Walker. Dr. Walker had died on Nov. 23rd, and the respondent had continued to act at the request of Mrs. Walker. The practice had not been sold to him, but to Dr. Struthers, and the solicitors of the late Dr. Walker had written to respondent asking him to introduce the new-comer to the patients. Not only had Dr. Lenten refused to do this, but he had left behind him no list of patients on the day-book, and had marked no appointments for dates after Dec. 15th, with one exception. The respondent's statutory declaration contained a significant observation: "I believed that Mrs. Walker and her solicitors really intended to sell the practice to me, and consequently I had no letter to the Editor of the *Daily Record*, and had received a reply, obviously in a stock form, beginning, "Dear Sir, or Madam—," saying that the letter had been forwarded to the London doctor, who was desirous of getting a Glasgow doctor to deal with sufferers in Scotland, and that the applicant would hear from this second doctor in due course. The fact that the clerk did not purport to be resident in Scotland showed that the letter was a stock one. Statutory declarations by Dr. James Neal and Mr. F. D. Whitwell, the clerk, were put in.

Mr. Frampton, on behalf of the respondent, said that his client had committed the offence charged. There could be no doubt that he had been associated with or had acquiesced in the publication of two of the articles. The third had been merely a report of the proceedings at the Mansion House, and Dr. Brown could have had nothing to do with it. Nevertheless he, counsel, could not agree with the views of Mr. Hempson. Dr. Brown had devoted a good deal of his time to research work, and believed, rightly or wrongly, that his method was a cure for many maladies. Mr. Frampton asked whether a medical man was not entitled to announce a cure, so long as he did not announce his name with it. The Asthma Research Council had submitted ten cases to him in August of last year, and he had reported in November. The newspaper had published a letter from a patient, recording the result of treatment by "a London doctor," and had asked if there were really a cure for asthma. The newspaper had got into touch with Dr. Brown through a press-cutting agency. He had written enjoining secrecy, and at the request of the editor had treated the inquirer for a fortnight. As a result of the publication of this case 120 persons had written to the editor asking to be put in touch with Dr. Brown. Of these he had treated 23 free of charge. Dr. Brown had perhaps been mistaken in his view that if he withheld his name there could be nothing to identify him with these articles. He had been making arrangements to transfer all the Scottish patients to local practitioners, and had offered to demonstrate his method to any member of the profession. The clerk who had visited him had said that he was prepared to pay, and so a fee had been named.

Mr. Frampton referred to the blunder which had led to the erasure of Dr. Brown's name in 1924 for publishing a signed article in *John Bull*, and gave an undertaking on his behalf to refrain in future from communicating with the lay press.

The Council found the charges proved to their satisfaction, and directed that the name of Dr. Haydn Brown be erased from the Register.

The Case of William Mulhall Corbet, registered as William Corbet, of 66, Finsbury Pavement, London, E.C. 2, M.B., B.Ch. 1915, N.U. Irel., who appeared before the Council on the following charge:—

> "That, being a registered medical practitioner; (1) you have associated yourself with and/or been employed by The British Institute of Inhalation Therapy, an institution which advertises for the purpose of obtaining patients by means of a printed card describing you as the 'Physician in Charge' and giving the method of treatment and the fees and the hours of treatment; (2) you have acquiesced in such advertising for the purpose of obtaining patients to your own professional advantage. And that in relation to the facts so alleged you have been guilty of infamous or disgraceful conduct in a professional respect."

The complainants were the Medical Defence Union.

Dr. Corbet appeared in answer to his notice, accompanied by Mr. B. M. Cloutman, counsel.

In opening the case, Mr. Hempson said that the respondent was physician in charge of the Institute. On Dec. 19th, 1928, Mr. S. Coulson, a clerk in the employment of the British Medical Association, had received a printed card headed "British Institute of Inhalation Therapy; Physician in Charge, Dr. William Mulhall Corbet." The work of the Institute and the treatment were described, and a scale of fees set out. A covering letter stated that Mr. Coulson had made inquiries about the Institute in 1924. The wording of the card showed that it was not merely sent out to persons who were patients of the Institute and who had made inquiries, or there would be no need for the detailed information it contained. It was not within the bounds of professional propriety to "follow up" inquiries in this way. Mr. Hempson had instructed his clerk, Miss E. I. Ash, to write a letter drafted by himself to Dr. Corbet; in it she had represented that she was contemplating a course of treatment but wished to know what the fees were, as the question of expense was important. The respondent, in reply, had not inquired how she had come to hear of the Institute; he had treated it as a normal inquiry from a person who had received a circular. He had stated that the usual fee was three guineas for a first consultation and two or one for subsequent visits. No clearer case of a medical man attracting patients by means of circulars had ever come before the Council. It was reprehensible that a person who, four years before Dr. Corbet had been associated with the Institute, had been a mere inquirer, should be put on a list and systematically followed up with persuasions to undergo treatment.

Miss Ash's statutory declaration was put in, Mr. Cloutman offering no objection.

Dr. James Neal testified to his statutory declaration, and based his case entirely upon the card received by Mr. Coulson. He considered the card an absolute advertisement to attract the lay public. The President ruled out of order questions put by Mr. Cloutman to extract witness's opinion of methods employed by other institutions. Witness said that the name on the card was that of a doctor who had had nothing whatever to do with Mr. Coulson. He had made no inquiries as to the conduct of this particular Institute. Re-examined, he stated that it was not usual to state fees on any notification, and that he himself would not have regarded an inquirer such as Mr. Coulson was alleged to be as his patient.

Mr. S. Coulson testified to his receipt of the card, which had been left at his house like an ordinary advertisement. He had made no inquiries either in 1924 or at any other time, and had not invited the notification in any way. Confronted with the record card of the Institute, which bore his name and address and a reference number, with notes suggesting that a series of letters had been sent to him, he stated that he had never received a communication from the Institute before.

Dr. Corbet, giving evidence on his own behalf, stated that he had first heard of the Institute four years before at a medical dinner, and had soon afterwards visited it and became interested in its work. He had installed inhalation apparatus in his own surgery. In 1927, when he was considering a closer association with the Institute, he had visited the Registrar of the Council together with one of the directors, Mr. Douglas Hamilton, who had financed the company and had spent £16,000 to £20,000 on it, but had not profited by it. He had later made enquiries about the professional conduct of the Institute, which he had ascertained to be entirely satisfactory. It was not conducted for profits, and he had never seen any advertisements of it in the lay press. In April, 1928, he had succeeded the German physician in charge at £1400 per annum. The agreement had been a purely verbal one. He had also been appointed a director. In reply to a question by the Legal Assessor, he said that he did not know whether the Institute was a limited company, or whether it had any articles of association. He had been given one hundred shilling shares as a qualification, and had never made a profit; his holding was merely a question of status. He had desired to be a director to be able to keep an eye on the medical proceedings. The other members were Mr. Douglas Hamilton, Mr. Gavin Hamilton, and Major W. E. Collison. As a result of a decision to appoint an English physician and reduce the fees, this card had been prepared for circulation to patients and inquirers. He admitted to the President that the name of the new physician in charge was the only indication of the change. Twenty-five per cent. of the patients were treated free. Witness had had the with individual States. To do this would require fresh legislation in this country, similar to the Medical Act (1886), Amendment Act, 1905, which made it possible to arrange reciprocity with individual Provinces in Canada. Some 13 of the United States require all practitioners to be naturalised, and a decision against the validity of this provision in Nebraska would presumably hold good against these States as well. Nevertheless, there is no near prospect of British practitioners in the United States obtaining the same facilities as those available in other countries.

Royal College of Physicians and Surgeons of Canada.

The Executive Committee received from the Dominions Office a copy of the Act of the House of Commons of Canada by which this College was recently incorporated. The Act was passed in response to a petition from the Canadian Medical Association. The College consists of all those who, when the Act came into force, were professors of medicine, surgery, gynæcology or obstetrics in a Canadian University. A Provisional Council is to be convened, within six months of the passing of the Act, by the General Secretary of the Canadian Medical Association. This will consist of all persons present who are entitled to become Fellows of the College, and their duty will be to elect a Council of Officers for four years. The Council may, during the first two years, admit as Fellows without examination any duly qualified persons resident in Canada who have given evidence of high ability in medicine. They may also admit at any time, without examination, persons practising in Canada who possess a diploma or fellowship equal to those of the College, and may make such honorary Fellows as they think fit. Candidates for examination must be licensed to practise in a Canadian Province, and must have been qualified three years. The College is allowed to hold real estate to the annual value of fifty thousand dollars.

Qualification of Foreign Graduates.

The South African Medical Council had written to the General Council asking for reassurance that no licensing body in this country admitted a foreign medical graduate to its final examinations until he had undergone education and training equivalent to that required within the Union. (A British qualification entitles its holder to registration in most parts of the Dominions, including South Africa.) In its reply the Executive Committee stated that the Council had no direct power to make rules governing the training and examination of students. If their resolutions and recommendations were not adopted by the licensing bodies, they could only make representations to the Privy Council; without special authorisation from the Privy Council, they could not refuse to register a qualification. Licensing bodies *had full power to recognise training and examinations* undergone in the Dominions and foreign countries. The Council, moreover, pointed out that in recognising qualifications obtained in the Dominions—e.g., in South Africa—they had no powers of visitation or inspection, and granted recognition solely on documentary evidence. In these circumstances, there was no need for the South African Medical Council to apprehend that any students would be qualified without course of study and examination equivalent to that required in this country.

A SANATORIUM IN THE ISLE OF MAN.—A tuber*culosis sanatorium is to be established in the Isle of Man in* a building erected about 30 years ago by the Ramsey Corporation which was formerly used as a hospital for infectious diseases.

CONGLETON WAR MEMORIAL HOSPITAL. — Lord Moynihan recently opened an extension of this hospital which includes three emergency wards and accommodation for the staff. He is reported as saying he had never seen a hospital better fitted for its work, so well planned and furnished, or in such perfect surroundings.

LOCAL GOVERNMENT REFORM AND VOLUNTARY HOSPITALS IN SCOTLAND.

DISCUSSION AT ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.

THE President of this Society, Dr. JOSHUA FERGUSON, took the chair at the annual general meeting held on May 3rd, when an address was given by Dr. J. PARLANE KINLOCH on the Effect of Local Government Reform on the Voluntary Hospitals in Scotland. *He said that at the present time the whole medical* organisation of the country was in a state of transition. His department was attempting to formulate a comprehensive scheme, and in doing so it was taking steps to consult with the medical profession in the four great centres of Scotland. Any opinions which he might express were not to be taken as final, or as having Government sanction. With regard to finance, the whole position with regard to expenditure on health services had been reviewed in 1926 by the Royal Commission on National Health Insurance. We were now spending so much on these services as compared with our trade competitors that there was no case for increasing the contributions by employers, workers, or the Treasury until the whole health administration of Britain had been overhauled.

Coöperation between Statutory and Voluntary Hospitals.

With regard to the hospitals, three types of institution had to be considered: (1) the great voluntary hospitals; (2) the public health hospitals; (3) the poor-law hospitals. Accepting the view of the Insurance Commissioners that the health services of the country must be reorganised within the existing financial commitment of the Treasury, it followed that the voluntary hospitals must be maintained at their present level and, if possible, expanded. The Government contribution could then be used to fill up gaps in the existing hospital service and to round off the hospital system. It had been decided that the poor-law hospital system should be reformed, since, except in a few areas, the system was inferior in quality; and these hospitals must be brought up to a higher level all over Scotland. The reconditioning and reequipment of poor-law hospitals, and the change in their conditions of administration would be effected with the cöoperation of the voluntary hospitals, whose position would be safeguarded.

The Local Government Act laid it down that the local authority must submit, and have approved, a complete health scheme for its area, including child welfare, antenatal, and maternity services, medical inspection of school-children and of children of pre-school age, the prevention and treatment of infectious diseases, including tuberculosis and venereal diseases, and the treatment of general diseases in the reconditioned poor-law hospitals. These services would be augmented in certain directions. For example, it was proposed to provide medical treatment for school-children. To deal with these requirements they might increase the number of whole-time medical officers, or incorporate the practitioners within the public health service. The former was a bad solution in Dr. Kinloch's opinion, and he strongly urged the importance of bringing the practitioners into the scheme. If this was to be attained there must be organised action by the medical profession itself.

The National Health Insurance service had not been properly correlated so far with the public health services, but the administration of both services had now been centralised in the new Scottish Health Department. Extension of medical benefit to dependents was recognised as desirable, but there was available for such a purpose a sum of only 5 million pounds per annum. To carry out the scheme properly it would require 12 millions per annum.

It was proposed, therefore, to apply the whole of the funds at present available to the provision of a general practitioner service, while the whole cost of specialist services would fall to be met by the local authorities. The relation of this scheme to the voluntary hospitals and the medical teaching schools must be such that the medical schools embraced the whole. The teaching of medicine must be developed more on the preventive side. There had been some progress in this direction in connexion with the teaching of midwifery. There should be no difficulty about developing medical education along these lines, but there must be no hard-and-fast rules to prevent research work from being carried on in the statutory hospitals. The medical curriculum must be modified in some way.

The Staffing of Statutory Hospitals.

It was important to prevent competition between the voluntary and the statutory hospitals. They must have the same staffs for both. He suggested that members of the visiting staffs of the voluntary hospitals should be ex officiis consultants within the statutory hospitals and that the routine consultant work in the statutory hospitals should be undertaken by the assistants from the voluntary hospitals' staffs, acting under the supervision of their own chiefs as consultants. There was not enough money to pay a big staff of specialists. For this reason it was not proposed to interfere with the present status and privileges of the " chiefs " in voluntary hospitals. At present they had a certain say in the admission of patients and so forth, and it was now proposed to continue this privilege with certain modifications. By a system of allocation of cases the voluntary hospitals would be kept full, the superintendents and the medical officer of health reviewing the waiting list from day to day. The normal mode of admission of patients would be from the central waiting list, but if any particular case was wanted by a surgeon it would go to his wards, and would not appear on the general list. There would thus be a new organisation from the centre outwards.

The present referee system must be replaced by one in which local referees were increasingly employed and the regional referees were connected with the consulting teams in the various hospitals. These regional referees would act as a link between the medical officer of health and the voluntary and statutory hospitals on the one hand, and the general practitioners on the other hand. It was essential to put a stop to the present excessive medical certification of disablement. This would be possible only when there was an adequate consulting service.

There were three important sections in the new Bill relating to hospitals: (*a*) Section 14, giving power to transfer poor-law hospitals to the public health hospital service; (*b*) Sections 27 and 28, the vital hospital clauses; and (*c*) Section 65, requiring a definite standard of efficiency in the hospital service.

Expansion of the Medical Schools.

The larger public health areas defined by the Local Government Act would permit of more efficient health services within each of these areas, but the most important aim was to have the health services of these new and enlarged local authority areas orientated towards the medical schools. In other words, the whole tendency was to evolve a regional hospital and medical service scheme out of the new local authority medical service scheme. For this purpose Scotland naturally fell into four main areas supplying the four medical teaching schools. From the point of view of the Central Department of Health such a regional system was in process of being developed in connexion with the National Health Insurance service.

So far as the medical teaching schools were concerned it would be an easy matter to undertake that the teaching hospitals were supplied with a suitable admixture of cases. If, however, this were regarded as the solution of the teaching problem, then the medical schools must be content to be miniature medical schools. The real solution of the problem was for the medical schools to expand and embrace the statutory hospitals of their areas. Under such an arrangement and without interference with the management of the voluntary and statutory hospitals, the teachers in the teaching hospitals would have access for teaching purposes to the statutory hospitals and their assistants would largely be employed in providing the actual specialist medical and surgical services required by the local authority hospitals. Under such an arrangement there would be a copartnership of the university authorities, the authorities of the voluntary hospitals, and the authorities of the statutory hospitals.

Discussion.

Dr. A. S. M. MACGREGOR thought that it would be long before all the contemplated schemes came into operation. There must be gradual progress and evolution. In his opinion no proper scheme of medical treatment could be made without extension of benefits to the dependents of insured persons. He agreed with Dr. Kinloch that the interests of the voluntary hospitals as medical training schools must be paramount. The great benefit of the new proposals was that they removed the poor-law system and opened up a whole field of disease to be dealt with in an organised way.

Prof. E. P. CATHCART spoke of the difficulty of altering the medical curriculum as at present constituted; he did not think it possible to do so without lengthening it.

Prof. J. H. TEACHER expressed his hearty sympathy with Dr. Kinloch's proposals to improve the facilities for teaching. He pointed out that in Glasgow, at least, an important reform of the curriculum in harmony with the views of Dr. Kinloch was already in force—namely, the scheme which had been initiated by Prof. Munro Kerr in connexion with the teaching of midwifery. The scheme would economise the student's time and would emphasise the preventive side of medicine.

Dr. J. B. MILLER considered that the proposals outlined by Dr. Kinloch were a charter for the general practitioner of the future. The National Health Insurance Act was ostensibly an effort to raise the health of the people, and the bringing in of dependents was a necessary development of this idea.

Dr. J. FERGUSON SMITH said that an important part of the work of the voluntary hospitals was done in the out-patient departments, and that no scheme which failed to realise this was likely to be satisfactory. He asked what provision was to be made for the support of the younger consultants. There were already probably twice as many men and women required to do the work of the hospitals as could make a reasonable living from the practice of their specialties, and if the new statutory hospitals drew off any appreciable fraction of those who now obtained special treatment in private, the position would be aggravated.

Dr. JOSHUA FERGUSON and Dr. JAMES TODD also took part in the discussion.

Reply.

Dr. KINLOCH said that he must remind them that the extension of medical benefit to dependents was still in the future. If funds were diverted to specialist service there would be nothing available for the provision of benefits for dependents. This was the reason for bringing in the local authority. He wished to make clear the intention that the voluntary hospitals should control their own affairs and that the statutory hospitals should be managed by the local authority. The consultants would remain in the same relation to the voluntary hospitals as at present, and would, in addition, join the staffs of the statutory hospitals, where they would be working under the conditions existing in those hospitals.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Consumption of Sea Fish.

THE amount of fish eaten in Germany is small, the average quantity consumed being 17 lb. per head per annum, as compared with 50 lb. in England, whereas the consumption of meat is about the same in the two countries. The Minister of Food lately took the chair at a meeting in Berlin, intended to popularise sea fish as part of the diet. A member of his Ministry said that the transport of fish from the shore to the kitchen is organised under the best hygienic conditions, and that the German fishing fleet is prepared to meet all demands. The kinds of fish principally found in German waters are rich in lipoids, cholesterol, lecithin, and vitamins. Calcareous substances, phosphorus, iron, and iodine are present in them too, and it has been observed that the incidence of goitre increases with distance from the sea. Fish is easily digestible and this applies also to dried fish, which are rather liked in Germany. There are no fish diseases which may prejudice the health of the consumer, and fish cannot be dispensed with in the diet of convalescents, or of patients suffering from gastro-intestinal diseases, gout, diabetes, and nervous affections. It is a pity therefore that the consumption of fish is not yet as general in Germany as in other countries.

Anthrax from Goat-hair.

Six of the workers in a brush factory some time ago developed anthrax, five of them dying from the infection, which was traced to goat-hair imported from China. The manager of the factory was prosecuted for manslaughter through negligence, because he had allowed the hair to be handled though he had been informed by the importer that it had not yet been disinfected. The district court gave a verdict of not guilty, in view of medical evidence that disinfection was not an absolutely reliable protection against anthrax. On appeal, however, the High Court quashed the verdict and sentenced the man to six months' imprisonment. This court held that the defendant had acted with gross negligence, since disinfection would have destroyed most of the bacilli.

Statistics of the Medical Profession.

This year's statistics show that the number of members of the medical profession residing in Germany, the Saar District, and the City of Danzig is 48,507, of whom 2376 are women. Twenty-eight per cent. of the profession describe themselves as specialists, showing an increase of 7 per cent. over the corresponding figure last year, whilst the number of medical men and women in general has increased by 2·5 per cent. On an average there are 12·4 medical men to each 10,000 of the population in the large cities as against 5·5 in the smaller towns and in country districts. The number of medical women has increased by 25·6 per cent., the majority of the additions being to the ranks of the specialists in diseases of children. 1535 medical men and 140 medical women are under 25 years old; 768 medical men but only 5 medical women are over 70, women having been admitted to qualification only for the last 30 years.

Radium Treatment of Exophthalmic Goitre.

Prof. Gudzent, of Berlin, describes the results of radium treatment of exophthalmic goitre. A dose of 100 mg. of radium-element is applied in 6 tubes for 24 hours and the treatment is sometimes repeated after ten weeks' interval. In 83 per cent. of the cases the goitre was reduced. The thyrotoxic symptoms disappeared in as many as 94 per cent. The disease responds rather slowly; toxic symptoms disappear first, the patients regain their sleep, and become less nervous; later, tachycardia, exophthalmia and finally the hypertrophy of the thyroid gland are diminished. Prof. Gudzent believes that thyrotoxicosis is curable by means of radium and that only in cases where this method has proved useless should an operation be performed. In ordinary cases of goitre he holds operation to be indicated.

Contributions under the Insurance Act.

According to recent statistics a workman earning 1750 M. a year has to pay 9·01 per cent. of his wages for health insurance. If he earns 2500 M. his contribution amounts to 8·3 per cent. It must be noted, moreover, that the employer has to pay a third of the health insurance and the whole of the accident insurance policy of his employees. Employees who are not workmen earning 1800 M. pay 8·8 per cent. of their salaries; those earning 3000 M. pay 8·3 per cent., and those earning 3600 M. 8·2 per cent. Persons with a small income have thus to pay more in proportion than those with a higher one.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

An Eastern Bureau of Health.

THE international aspects of disease in relation to quarantine were discussed in the Section of State Medicine of the recent Calcutta Congress, and the printed report is now available. The Public Health Commissioner for India recounts the systematic attempt now being made to coördinate international information of disease, and explains how some of the functions of the health section of the League of Nations, created in 1923, have come to overlap those of the original International Bureau at Paris, which has been in existence since 1907. A progressive extension has been made possible by successive grants from the Rockefeller Foundation, and one of the most outstanding events has been the establishment four years ago of an Intelligence Bureau at Singapore. The February meeting of the advisory council was attended by delegates from the Dutch East Indies, various British colonies and dependencies, China, French Indo-China, Japan, the Japanese colonies, Siam, and British India. Information of the occurrence of infectious diseases in the major ports is cabled weekly, on a fixed day, by each country to Singapore, where it is collated and broadcast in code for the benefit of the several Asiatic administrations. India picks up the broadcast at the Himalayan wireless station near Simla, and the public health department sends it on to the chief Indian ports, while abbreviated messages are also re-broadcast for the information of shipping in the Arabian Sea and Indian Ocean. In the same way the details are received by the other countries concerned, so that each has exact information every Friday regarding the state of infectious diseases in the principal ports of Asia to the number of 150. Appropriate measures can thus be taken against arrivals from infected ports. The increasing interest of the health organisation of the League of Nations in international hygiene is shown by the arrangements now in progress for the Malaria Commission of the League to visit India in the coming autumn.

Osteomalacia in India.

In the section of gynæcology at the same Congress, Dr. A. C. Scott, of the Women's Medical Service, speaking about osteomalacia in India, remarked that in her experience the disease was very prevalent, and estimated that in the areas most affected it accounts for more than 17 per cent. of the fatal cases of abnormal midwifery which come to women's hospitals. She considered that the chief causes were damp, dark dwellings, lack of sunlight, a deficiency of vitamin A in the diet, and bad hygiene in general; it followed that the disease was preventable. Dr. Scott's inquiry showed that the distribution of osteomalacia is very irregular, Kashmir and the Bombay presidency

CANCER OF THE COLON.

To the Editor of THE LANCET.

SIR,—I cannot agree with some of Mr. Flint's remarks, for I think Mr. Grey Turner is perfectly correct in preferring the oblique incision over the colon on the left hand side to the paramedian incision. After considerable experience of the oblique incision I have come to the conclusion it is far the most satisfactory. The rectus is dissected out of its sheath and displaced towards the middle line. This incision gives very free access to the colon and enables mobilisation of the splenic angle to be quite readily and easily carried out should this be required. With a paramedian incision mobilisation of the splenic angle is difficult. I have never seen post-operative hernia follow this incision, and in my experience it is one of the most satisfactory incisions as regards after-results as any used in the abdominal wall.

In regard to the blood-supply of the colon, in my opinion necrosis following anastomosis is always due to bad blood-supply, and I have actually seen this happen in the past on more than one occasion. More particularly is this the case in the common situation for growth towards the lower end of the sigmoid flexure. I agree with Mr. Flint as to the safety of Paul's operation, but he fails to mention two serious objections to it: (1) that it involves undergoing two, if not three, operations; and (2) that it most invaribly leaves a weak scar with liability to tiresome hernia.

I am, Sir, yours faithfully,

London, June 3rd, 1929. J. P. LOCKHART-MUMMERY.

SPRUE AND CŒLIAC DISEASE.

To the Editor of THE LANCET.

SIR,—In connexion with Dr. Thaysen's article in your issue of May 25th (p. 1086) on the differentiation of these two diseases, it may be of interest to recall that Dr. A. C. Hampson and myself demonstrated by the graphic method (Guy's Hospital Reports, April, 1924) that the blood in sprue showed the same megalocytic changes as in Addison's (pernicious) anæmia. At the same time we examined the blood of several cases of cœliac disease, though at the time unfortunately only one or two cases were available; in these we found no corresponding blood changes. These last results were never published. There would thus seem to be a simple and effective method of differentiating the two diseases, though admittedly further work is needed on these lines.

I am, Sir, yours faithfully,

J. W. SHACKLE, M.R.C.S., L.R.C.P.

Guy's Hospital, S.E., May 30th, 1929.

EPHEDRINE AND EPHETONINE.

To the Editor of THE LANCET.

SIR,—In the report of a discussion on the Action and Use of Ephedrine (THE LANCET, May 18th, p. 1036) I am credited with the statement: "In Germany ephedrine had been synthesised and with a mixture of dextrose placed upon the market as ephetonine." This has obviously been wrongly reported, no doubt from the resemblance of dextro and dextrose. The statement I actually made was to the effect that ephetonine is a compound of dextro- and lævo-rotatory ephedrine, manufactured synthetically.—I am, Sir, yours faithfully,

Oxford, May 30th, 1929. J. A. GUNN.

HOSPITAL COÖPERATION IN DEVON.—A conference of representatives of hospitals in Devon has been held at Exeter to consider the situation created by the Local Government Act. The outcome was the appointment of a Committee, consisting of an equal number of representatives of large and small hospitals and medical men, of whom three are to be general practitioners.

Public Health Services.

SCHOOL MEDICAL SERVICE.

—	No. on roll.	Aver. E.S. attendance.	Routine inspections.	Specials and reinspections.	Per cent. of defects.*
Hull	47,033	40,512	16,983	46,156	20·8
Sheffield ..	79,712	71,452	27,693	136,684	16·07
Leicester ..	31,271	27,565	10,347	30,089	14·59

E.S. = Elementary school.

* Excluding dental defects and uncleanliness.

Hull.

Dr. W. A. Daley, in his introduction to the detailed report of Dr. J. Morrison, shows that the coördination of the public health work has gone so far as to include even the port sanitary medical officers. There are now in Hull four senior assistant medical officers of health dealing respectively with: (1) tuberculosis; (2) maternity and child welfare; (3) school medical service; (4) port sanitation and infectious disease, each available to come to the aid of another in times of pressure. The institutions belonging to each department are at the service of the others—e.g., the clinics, sunlight apparatus, and disinfecting station.

Much progress has been made in developing facilities for treatment such as X rays for ringworm, while the East Hull Clinic, the open-air school, and an orthopædic hospital are in preparation; a sight-saving class and an open-air class are already working. The increasing recognition of the good work done at the clinics is shown by the rise in total attendances during the year from 148,132 to 229,893. In pursuance of a definite policy a stand is being made against the treatment of casual dental cases at the clinics and since the parents have to obtain and usually pay for emergency treatment they are coming to realise the value of routine conservative work which largely obviates its necessity. Light treatment given at the Infant Welfare Centre to school-children is mainly afforded by the mercury-vapour and carbon arc lamps. Dr. Morrison states that while the number of cases so far treated (52) is too small for final conclusions, the treatment of definite diseases is on the whole disappointing as regards cure and the benefits obtained seem to be mainly attributable to the general tonic effect. He adds, however, that these results with school-children are in marked contrast to those obtained with cases from the other two departments in whom it was found that active rickets and some forms of tuberculosis, notably lupus, did remarkably well. The orthopædic clinic has been almost overwhelmed by the results of last year's epidemic of anterior poliomyelitis.

Dr. Morrison has made an important study of the distinction between the dull and the backward children. The dull are found to be nearly as defective in general intelligence (measured by the Stanford Binet tests) as in educational attainments. They are a large and important class, never able to attain an average level of education, which should be dealt with by special methods. The backward, on the other hand, have far higher innate intelligence and their school failure is attributable rather to extrinsic factors such as ill-health, bad sight or hearing, or to lack of suitable educational facilities. With them may be grouped the cases of delayed development who can recover lost ground—a small number in Dr. Morrison's experience.

Mr. Meadon Baker, the organiser of physical training, states the governing factor that will lead to the desired goal of good posture is the teachers' personal attitude to the physical work. If the teacher shows real faith by persistent effort, good posture can be obtained, and by daily exercises the commonest types of deformity, round shoulders and flat chests, can be almost eradicated.

Sheffield.

Dr. Thomas Chetwood writes that as his report is framed on set lines, it must largely consist of statistics, adding: "Figures alone give only an imperfect picture of the work that has been done and require some explanation." A few lines later he quotes Sir George Newman: "If when the reader turns to study these dull records of the school medical service he will come with understanding, he will discover the hidden secret of an unseen reform which is silently but certainly changing the prospects and hopes of the English people." It seems all too true that the mass of facts here set forth has precluded some of the interesting observations to which Dr. Chetwood has made us yearly look forward; but at the same time they do reveal what an immense amount of work is being done and the progress that is being made. For example, the clinics have grown until it can almost be said that the accommodation is adequate, and the latest clinic on the Manor Estate Dr. Chetwood is able to describe as "the best that I have yet seen anywhere in England."

The number of routine examinations made during 1928 was nearly 5000 more than in 1927. The general condition of the children as shown by their physique, nutrition, and cleanliness tends steadily to improve; interesting anthropometric tables show that the improvement in height and weight has brought them more than up to the new standards of the Board of Education. Attendances at the clinics go on increasing, but in one aspect this is not so satisfactory. Additional evening clinics are now held for children suffering from toothache, but it is stated that parents consent to extraction but fail to appreciate the value and importance of sound conservative treatment and that many of the children who come to the "toothache" clinic are those whose parents have previously refused routine dental treatment. In some parts of England the evils of such a proceeding have led to reduction of facilities for treatment of "casuals" with added emphasis on routine conservative work.

A great step forward has been taken with the orthopædic scheme which is now awaiting the appointment of an orthopædic surgeon to be complete. Mr. H. A. Cole, chief superintendent of physical training, gives a critical survey of his work in Sheffield. He stresses the importance of good posture, any deviation from which means a strain upon one or more organs, and states that in classes where attention is paid to posture there is a brightening up in alertness of both body and mind. Games played on open spaces, he says, have both an immediate value as an antidote to cramped homes and school conditions and a preventive of ailments which is economically better than remedial treatment. The indirect gain from the wider outlook obtained by contact with other schools fosters the social amenities on which the fabric of civilisation is built.

Leicester.

Dr. A. Warner explains the increase in work at the clinics as due in part to an arrangement with the county council by which the aural clinic is more fully utilised, and partly by the greater number of dental cases, due to the appointment of an additional dentist and the establishment of a clinic in a school. He believes the chief obstacle to securing more general dental treatment to be the reluctance of parents to spend money and time in getting to the clinics and waiting there. If this is correct, the solution will be found in establishing dental clinics at the schools so that the children can, with the parents' consent, be taken direct from the classroom. In one such example 100 per cent. of those needing dental treatment were actually treated.

Mr. J. A. Keen, the aural surgeon, gives the records of some 17 children treated by the Zünd-Burguet method with exact measurements of the auditory acuity. The work was done in his private consulting-room at his own expense. The scheme for the treatment of out-patients' cripples and for the use of ultra-violet light has now received the sanction of the Board of Education and the buildings are likely to be proceeded with at once. A day open-air school is planned and good work has been done by two special classes run on the lines of an open-air school. The Mablethorpe Summer Camp, which is a voluntary institution, was used for two months last autumn as a residential open-air school, and Dr. Warner says he cannot remember any previous year in which the children appeared to benefit so much.

The organisers of physical training, Mr. R. G. Lean and Miss Jean Bennett, state that physical education aims at the physical, mental, and moral development of the individual and is thus an integral part of general education—and we might add closely related to school hygiene. Its association with obsolete forms of drill and meaningless manœuvrings may readily stifle the real spirit of education, and continued efforts are being made to give teachers the right concept of the work by special courses of instruction. Closely related to this work is that of remedial exercises, which is continuing to give good results. Dr. Warner has conducted a special inquiry on the influence of the home on the nutrition of the child, and compared 100 children from good homes with a similar number from poor homes. He found unmistakable evidence that the improved home conditions of group A have already had a beneficial effect on their general physique and nutrition, with definitely less evidence of rickets and chronic catarrhal conditions so often the precursors of definite ill-health.

Another unusual inquiry is that of Mr. Keen into the auditory ossicles from the specimens collected at mastoid operations. Many new facts are brought to light, one of them being the observation that the dimensions of these structures do not vary with age; they are already full size at birth.

INFECTIOUS DISEASES IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 25TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 298 (last week 362); scarlet fever, 1778; diphtheria, 875; enteric fever, 46; pneumonia, 1300; puerperal fever, 53; puerperal pyrexia, 93; cerebro-spinal fever, 18; acute poliomyelitis, 8; encephalitis lethargica, 23; dysentery, 8; ophthalmia neonatorum, 108. No case of cholera, plague, or typhus fever was notified during the week.

The largest incidence of small-pox at the moment is in London (Poplar, 14 cases; Stepney, 20); South Shields, 13; West Ham, 28; Leigh (Lancs), 13; Stoke-on-Trent, 18; Swindon (Wilts), 9; Merthyr Tydfil, 10.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on May 28th–29th was as follows:—Small-pox, 307 under treatment, 10 under observation (last week 332 and 12 respectively); scarlet fever, 1411; diphtheria, 1569; enteric fever, 13; measles, 132; whooping-cough, 717; puerperal fever, 27 (plus 9 babies); encephalitis lethargica, 111; poliomyelitis, 2; "other diseases," 58. At St. Margaret's Hospital there were 18 babies (plus 10 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was 1 death from small-pox, 5 (1) from enteric fever, 81 (3) from measles, 5 (1) from scarlet fever, 63 (11) from whooping-cough, 21 (3) from diphtheria, 53 (10) from diarrhœa and enteritis under two years, and 51 (12) from influenza. The figures in parentheses are those for London itself.

The death provisionally classified to small-pox was assigned to Wimbledon. Another death from small-pox provisionally assigned to Rochdale should have been reported in the return for the week ended April 13th. Four more deaths provisionally classified to small-pox are now reported for the month of April and assigned 2 to Gravesend (Kent) and 1 each to Sale (Cheshire) and Caerphilly (Glamorgan). No great town reported more than 3 deaths from influenza except Birmingham with 4. Liverpool reported 16 deaths from measles, Sunderland 16, Birmingham 11, and Leeds 10. Manchester reported 9 deaths from whooping-cough;

Leeds 5, and Birmingham 4. Diarrhœa claimed 6 deaths each in Birmingham and Manchester and 4 in Liverpool. The number of stillbirths reported during the week was 270 (corresponding to a rate of 45 per 1000 births), including 56 in London.

DEATHS FROM SMALL-POX.

The fatal case of small-pox which occurred in Lincoln in the week ended April 13th was that of a woman, aged 36 years, who was a passenger on the *Tuscania*. It is understood that she had intended to travel from Liverpool to a destination in Wales, and notified the Liverpool Port Sanitary Authority to that effect; on leaving the ship however, she changed her mind, stayed one night in a hotel in Liverpool, and travelled to Lincoln on April 3rd. She became ill on the 4th or 5th, and was seen soon after by a private medical practitioner, who called in the deputy medical officer of health on the 9th, when she was removed to Lincoln Isolation Hospital. The initial symptoms from the 6th to the 8th are understood to have been severe, and a prodromal rash appeared on the 9th. On that day Dr. D. C. Lamont, medical officer of health, tells us that the patient had a vivid erythematous rash on the face, neck, shoulders, and upper portion of the front of the thorax. Numerous cutaneous hæmorrhages were to be seen all over the body with the exception of the abdomen, and two or three papules on the palm of a hand. She was drowsy and restless, and at times semi-conscious, temperature remained at 105° F. On the 10th "lobster rash" was more pronounced and the face swollen, but the rash had not extended in area. Two vesicles on the side of the abdomen had become umbilicated, and the papules on the hand had reached the early vesicular stage. The hæmorrhages which involved practically the whole of the trunk and all the limbs were purpuric in type, but the face and neck remained practically free. At noon on this day the patient was transferred to the Nottingham Small-pox Hospital, where she died about mid-day on April 11th. The diagnosis was hæmorrhagic or black small-pox with a prodromal "lobster rash," the true small-pox eruption being limited to about five vesicles. Dr. Lamont adds that there were two small vaccination vesicles present on one arm, each smaller than a threepenny-piece. The patient had been vaccinated successfully in infancy and again on board ship on (?) March 31st.

The death from small-pox assigned to Stoke-on-Trent in the return for the week ended April 20th was that of a child, 7 years of age, who was suffering from broncho-pneumonia. Dr. A. Wotherspoon, medical officer of health, informs us that the child's condition was hopeless on admission to hospital. The certificate was filled in: (1) broncho-pneumonia, (2) small-pox.

The fatal case at Woolwich in the week ended May 18th was that of a boy 9 years of age; the rash appeared on May 2nd and became confluent in the vesicular stage. Dr. J. Macmillan, medical officer of health, states that the source of infection was not definitely traced, but there are grounds for believing that it was associated with the Gravesend cases. The cause of death as given on the death certificate was "small-pox; never vaccinated."

Medical News.

Society of Apothecaries of London.—At recent examinations the following candidates were successful in the undermentioned subjects:—

Surgery.—W. T. Ellis, Manchester and Charing Cross Hosp.; A. Freitag, Charing Cross Hosp.; J. D. B. Games, St. Bart.'s Hosp.; W. St. A. Hendricks, St. Mary's Hosp.; L. G. E. K. Lewis, Middlesex Hosp.; and B. J. Niall, London Hosp.

Medicine.—F. W. Crossley-Holland, St. Bart.'s Hosp.; A. Freitag, Charing Cross Hosp.; K. E. Gallaher, Manchester; and K. M. Seedat, Charing Cross Hosp.

Forensic Medicine.—P. S. Balachandran, Middlesex Hosp.; A. Freitag, Charing Cross Hosp.; and K. E. Gallaher, Manchester.

Midwifery.—A. Campbell, Edinburgh; R. H. El Sawy, St. George's Hosp.; B. L. Fishout, Cardiff; A. Freitag, Charing Cross Hosp.; C. Parthasarthe, Birmingham; and A. Scher, Basle and London Hosp.

The Diploma of the Society was granted to the following, entitling them to practise medicine, surgery, and midwifery: F. W. Crossley-Holland, A. Freitag, and K. E. Gallaher.

University of Aberdeen.—The Senate has recommended to the University Court that Lord Beaverbrook's gift of £1000 be devoted to the purchase and the installation of X ray apparatus in the Anatomical Department of the University.

University of Cambridge.—It is authoritatively stated that in desiring the residue of his estate to be applied in perpetuity for the promotion of education in chemistry, biochemistry, physical science, and other allied subjects, the late Mr. John Humphrey Plummer expressed his wish that a professorship or professorships, each of the annual value of £1200, should be established in the University. The trustees are advised that the estate should yield an income of about £10,000 a year.

University of London.—The degree of D.Lit has been conferred on Mr. F. A. P. Aveling, D.Sc., University Reader in Psychology, for a Thesis on The Psychological Approach to Reality.

University College.—It is announced that the examination for two Goldsmid entrance exhibitions (which entitle the holders to the final course for a registrable medical qualification) has been deferred until July 19th. The subjects are anatomy, physiology, and general pathology, and candidates must apply to the Secretary of the College by July 6th.

University of Leeds.—At the next degree ceremony in July the honorary degree of D.Sc. will be conferred on Dr. T. Wardrop Griffith, professor of medicine at Leeds from 1910 to 1925, and previously professor of anatomy from 1887.

Epsom College: *Sir Walter Buchanan Scholarship.*—The Council will shortly award this scholarship, of about £38 a year. It is primarily intended for the sons of deceased or prematurely invalided officers of the Indian Medical Service, but failing any such candidates, it may be granted to the sons of legally qualified medical men of wholly British parentage in necessitous circumstances who have practised medicine for at least five years in India. Forms of application may be had from the Secretary, Mr. J. B. Lamb, 49, Bedford-square, London, W.C.1.

London Jewish Hospital Medical Society.—Sir Humphry Rolleston will open a symposium on Some Diseases of the Jews, at 3 P.M. on Thursday, June 13th, at the London Jewish Hospital, Stepney Green, E.

Research Defence Society.—The annual general meeting of this Society will be held at 11, Chandos-street, Cavendish-square, W., on Wednesday, June 12th, at 3 P.M., with Lord Lamington in the chair. Prof. A. V. Hill will deliver the Third Stephen Paget Memorial Lecture, entitled Enemies of Knowledge.

Indian Medical Service Dinner Fund.—The annual dinner of the Indian Medical Service will be held at the Trocadero Restaurant, Piccadilly-circus, London, on Wednesday, June 19th, at 7.15 P.M. Further information is obtainable from the joint Hon. Secretary, Sir Thomas Carey Evans, 31, Wimpole-street, W.1.

Australian and New Zealand Medical Association in England.—The summer dinner of this Association will be held at the Trocadero Restaurant, Piccadilly, on Friday, June 14th, at 7.45 for 8.0 P.M. Mr. F. F. Muecke will preside, and Mr. Sampson Handley and Prof. F. R. Fraser will be the official guests of the Association. All medical visitors from Australia and New Zealand, whether members of the Association or not, are invited to be present, and guests may be brought. Communications should be addressed to Mr. P. J. Jory, 26, Queen Anne-street, London, W.1.

South African Medical Association: Annual Congress.—The scientific meeting was opened at Port Elizabeth on May 13th by the Hon. A. P. J. Fourie. Dr. A. J. Orenstein inducted Dr. R. M. Leith into the Presidential chair. In doing so he observed that it could be said with truth that a country got the medical profession it deserved. Not only did the enlightenment of a country react in a subtle way on the medical men practising in it, but the work of progressive and altruistic practitioners could be so hampered by ill-conceived legislation, and by the apathy of public bodies as to reduce its potentiality for public service to a lamentably low level. Dr. Leith spoke of the ability of the medical profession to instruct and enlighten a public which was becoming increasingly interested in health matters, and ready to learn. But there was need, he said, for the profession first to educate themselves more on the preventive side. The student had been taught to regard the diagnosis and treatment of established disease as the important thing, and prevention had not always been sufficiently stressed in their training.

Dr. C. H. Durrant, Chief Medical Officer, St. Kitts-Nevis Medical Service, has been appointed an official member of the Legislative Council of the Presidency of St. Christopher and Nevis.

MANCHESTER'S WATER-SUPPLY.—In order to increase Manchester's water-supply a huge dam is to be constructed at Hawes Water in the Mardale Valley of Westmorland to add to the length and depth of the lake at a cost of about £12,000,000. Subject to the approval of the City Council, the Waterworks Committee have sanctioned the commencement forthwith of preparatory works. Five years will be required for completion of the scheme.

NATIONAL PHYSICAL LABORATORY.—The report of this laboratory for 1928 shows that its work has expanded considerably during the year. Numerous X ray protective materials such as lead glass and lead rubber have been tested and the X ray departments of many hospitals have been inspected. There are, it is stated, many indications that the publication of the recommendations of the X Ray and Radium Protection Committee, together with the facilities provided by the laboratory, have resulted in marked improvements in the standard of protection attained by British makers of X ray apparatus. During the year a constant voltage generator has been installed in the Radiology Department. The details of this machine are given in the report and are interesting as showing the trend of modern X ray generator design. In 1928 the unit of X ray intensity was defined, but much experimental work must be done before an ionisation chamber is evolved which satisfies the conditions laid down at Stockholm. Preliminary investigations have been undertaken at the laboratory, and these have yielded important results, in fact, attempts have already been made to express the barium platino cyanide dose in "r" units. The executive committee calls attention to the large amount of work relating to fundamental standards of measurement which has been done by the various departments. A section of the report devoted to definitions *of the units and standards employed at the laboratory* bears witness to the high degree of accuracy achieved in physical measurements.

INTERNATIONAL CONFERENCE ON HEALTH OF THE SEAMAN.—The announcement that the Second Conference on the Health and Welfare of Merchant Seamen will take place at Geneva on Oct. 7th, 8th, and 9th requires some supplementary information for the benefit of those who have not followed the movement of which this Conference is only one phase. Some five years ago Dr. Harald Engelsen, of the Norwegian Red Cross Society, submitted to the Board of Governors of the League of Red Cross Societies a far-reaching scheme for promoting the health and general welfare of the merchant seamen on both national and international lines. In 1926 the first Conference on the Welfare of the Seaman, known as the Oslo Conference, was convened by the Norwegian Red Cross Society and the League of Red Cross Societies, a unanimous decision being taken to appoint a Standing Committee which would ensure continuity and coördination of the policies adopted at this Conference. This Standing Committee has met on several occasions in Paris during the last three years, and its labours have been so fruitful that the time has seemed ripe for calling a second Conference, in order that the many forces available for the benefit of the merchant seaman may be coördinated on sound lines. This Conference is convened under the auspices of the Norwegian Red Cross Society, the League of Red Cross Societies, the International Unions against Venereal Disease and Tuberculosis, and the International Association of Mercantile Marine Officers. The British representatives mentioned in the provisional agenda are Sir John Sandeman Allen, who will deal with the general situation in home ports; Mr. Leonard Bowden, who will speak on welfare work and social insurance; Dr. W. M. Willoughby, who will discuss the problem of tuberculosis; and Dr. R. M. F. Picken, who will deal with venereal disease, all in connexion with the merchant service. The subject of ships' libraries will be discussed by Mr. A. Mansbridge in coöperation with Mr. G. Stenersen of Norway. For further information application should be made to the General Secretary of the Conference, Dr. F. Humbert, the League of Red Cross Societies, 2, Avenue Velasquez, Paris, VIII.

THE LANCET: SUBSCRIPTION RATES.

		£	s.	d.
INLAND	One Year	£2	2	0
	Six Months	1	1	0
	Three Months	0	10	6
ABROAD	One Year	2	10	0
	Six Months	1	5	0
	Three Months	0	12	6

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY, Albemarle-street, W.

THURSDAY, June 13th.—4.30 P.M. *The following papers will be read:* F. M. L. Sheffield: Chromosome Linkage in Œnothera, with special reference to some Fl. Hybrids. (Communicated by Sir John Farmer, F.R.S.) Grace Briscoe and Winifred Leyshon: Reciprocal Contraction of Antagonistic Muscles in Peripheral Preparations—using Flashing Neon Lamp Circuit for Excitation of Nerve. (Communicated by Sir Charles Sherrington, F.R.S.) W. S. Stiles: The Scattering Theory of the Effect of Glare on the Brightness Difference Threshold. (Communicated by Sir John Parsons, F.R.S.) T. Moran: Critical Temperature of *Freezing—Living Muscle. (Communicated by Sir* William Hardy, F.R.S.) E. C. Smith: The Formation of Lactic Acid in Muscles in the Frozen State. (Communicated by Sir William Hardy, F.R.S.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

WEDNESDAY, June 12th.—2 P.M. and 6 P.M., SURGERY. Provincial Meeting at Sheffield. Lunch can be obtained on the train. From 2 P.M.–5 P.M., Operations, Clinical Cases and Pathological Specimens at: (1) the Royal Infirmary; (2) the Royal Hospital. Also from 2 P.M.–5 P.M., there will be a demonstration of animal experiment to show the relation between diet and disease at the Field Laboratory. Tea will be provided and dinner for those who wish it later in the evening. A return train to London will be arranged so that Members can dine on it.

FRIDAY, June 14th.—5 P.M., OPHTHALMOLOGY. Annual General Meeting: Election of Officers and Council. Papers: Mr. E. Maddox: Demonstration of the Cheiroscope. Miss M. Dobson: Velanoskiascopy, a Control in the Correction of Astigmatic Defects.

RESEARCH DEFENCE SOCIETY, 11, Chandos-street, Cavendish-square, W.

WEDNESDAY, June 12th.—3 P.M., Annual General Meeting. Prof. A. V. Hill: Enemies of Knowledge. (Stephen Paget Memorial Lecture.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.

TUESDAY, June 11th.—5 P.M., Dr. H. H. Dale: Some Chemical Factors in the Control of the Circulation (last Croonian Lecture).

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

MONDAY, June 10th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Ward Visit. 2 P.M., Mr. Bishop Harman: Eye Department.

TUESDAY.—10 A.M., Medical Registrar: Ward Visit. 2 P.M., Mr. Addison: Operations. 2 P.M., Mr. Sinclair: Surgical Out-patients.

WEDNESDAY.—10 A.M., Dr. Owen: Children's Out-patient Department. 2 P.M., Mr. Tyrrell Gray: Operations. 2 P.M., Dr. Scott Pinchin: Medical Out-patients.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 11.30 A.M., Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. MacDonald: Genito-Urinary Out-patient Department.

FRIDAY.—10 A.M., Dr. Pritchard: Medical Ward Visit. 12 noon, Dr. Shaw: Clinical Demonstration. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Children's Medical Out-patient Department. 10 A.M., Resident Assistant Surgeon: Ward Visit. Medical and Surgical Out-patients at 2 P.M., daily. Operations. Special Departments daily, 10 A.M. to 5 P.M., Saturdays 10 A.M. to 1 P.M. Special Classes in Anæsthetics and Operative Surgery.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, June 10th.—2.30 to 5 P.M., Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M., Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M., Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M., Dental Clinics. 2.30 to 5 P.M., Medical, Surgical, Nose, Throat and Ear Clinics. Operations.

FRIDAY.—10.30 A.M., Throat, Nose and Ear Clinics. 2.30 to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, June 10th, to SATURDAY, June 15th.—MEDICAL SOCIETY, Lecture Room, 11, Chandos-street, Cavendish-square, W., M.R.C.P. Course of Lectures, on Tues. and Frids. at 8.30 P.M. Tues., Dr. Bernard Myers:

Leeds 5, and Birmingham 4. Diarrhœa claimed 6 deaths each in Birmingham and Manchester and 4 in Liverpool.

The number of stillbirths reported during the week was 270 (corresponding to a rate of 45 per 1000 births), including 56 in London.

DEATHS FROM SMALL-POX.

The fatal case of small-pox which occurred in Lincoln in the week ended April 13th was that of a woman, aged 36 years, who was a passenger on the *Tuscania.* It is understood that she had intended to travel from Liverpool to a destination in Wales, and notified the Liverpool Port Sanitary Authority to that effect; on leaving the ship however, she changed her mind, stayed one night in a hotel in Liverpool, and travelled to Lincoln on April 3rd. She became ill on the 4th or 5th, and was seen soon after by a private medical practitioner, who called in the deputy medical officer of health on the 9th, when she was removed to Lincoln Isolation Hospital. The initial symptoms from the 6th to the 8th are understood to have been severe, and a prodromal rash appeared on the 9th. On that day Dr. D. C. Lamont, medical officer of health, tells us that the patient had a vivid erythematous rash on the face, neck, shoulders, and upper portion of the front of the thorax. Numerous cutaneous hæmorrhages were to be seen all over the body with the exception of the abdomen, and two or three papules on the palm of a hand. She was drowsy and restless, and at times semi-conscious, temperature remained at 105° F. On the 10th "lobster rash" was more pronounced and the face swollen, but the rash had not extended in area. Two vesicles on the side of the abdomen had become umbilicated, and the papules on the hand had reached the early vesicular stage. The hæmorrhages which involved practically the whole of the trunk and all the limbs were purpuric in type, but the face and neck remained practically free. At noon on this day the patient was transferred to the Nottingham Small-pox Hospital, where she died about mid-day on April 11th. The diagnosis was hæmorrhagic or black small-pox with a prodromal "lobster rash," the true small-pox eruption being limited to about five vesicles. Dr. Lamont adds that there were two small vaccination vesicles present on one arm, each smaller than a threepenny-piece. The patient had been vaccinated successfully in infancy and again on board ship on (?) March 31st.

The death from small-pox assigned to Stoke-on-Trent in the return for the week ended April 20th was that of a child, 7 years of age, who was suffering from broncho-pneumonia. Dr. A. Wotherspoon, medical officer of health, informs us that the child's condition was hopeless on admission to hospital. The certificate was filled in: (1) broncho-pneumonia, (2) small-pox.

The fatal case at Woolwich in the week ended May 18th was that of a boy 9 years of age; the rash appeared on May 2nd and became confluent in the vesicular stage. Dr. J. Macmillan, medical officer of health, states that the source of infection was not definitely traced, but there are grounds for believing that it was associated with the Gravesend cases. The cause of death as given on the death certificate was "small-pox; never vaccinated."

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates were successful in the undermentioned subjects:—

Surgery.—W. T. Ellis, Manchester and Charing Cross Hosp.; A. Freitag, Charing Cross Hosp.; J. D. B. Games, St. Bart.'s Hosp.; W. St. A. Hendricks, St. Mary's Hosp.; L. G. E. K. Lewis, Middlesex Hosp.; and B. J. Niall, London Hosp.

Medicine.—F. W. Crossley-Holland, St. Bart.'s Hosp.; A. Freitag, Charing Cross Hosp.; K. E. Gallaher, Manchester; and K. M. Seedat, Charing Cross Hosp.

Forensic Medicine.—P. S. Balachandran, Middlesex Hosp.; A. Freitag, Charing Cross Hosp.; and K. E. Gallaher, Manchester.

Midwifery.—A. Campbell, Edinburgh; R. H. El Sawy, St. George's Hosp.; B. L. Fishout, Cardiff; A. Freitag, Charing Cross Hosp.; C. Parthasarthe, Birmingham; and A. Scher, Basle and London Hosp.

The Diploma of the Society was granted to the following, entitling them to practise medicine, surgery, and midwifery: F. W. Crossley-Holland, A. Freitag, and K. E. Gallaher.

UNIVERSITY OF ABERDEEN.—The Senate has recommended to the University Court that Lord Beaverbrook's gift of £1000 be devoted to the purchase and the installation of X ray apparatus in the Anatomical Department of the University.

UNIVERSITY OF CAMBRIDGE.—It is authoritatively stated that in desiring the residue of his estate to be applied in perpetuity for the promotion of education in chemistry, biochemistry, physical science, and other allied subjects, the late Mr. John Humphrey Plummer expressed his wish that a professorship or professorships, each of the annual value of £1200, should be established in the University. The trustees are advised that the estate should yield an income of about £10,000 a year.

UNIVERSITY OF LONDON.—The degree of D.Lit has been conferred on Mr. F. A. P. Aveling, D.Sc., University Reader in Psychology, for a Thesis on The Psychological Approach to Reality.

University College.—It is announced that the examination for two Goldsmid entrance exhibitions (which entitle the holders to the final course for a registrable medical qualification) has been deferred until July 10th. The subjects are anatomy, physiology, and general pathology, and candidates must apply to the Secretary of the College by July 6th.

UNIVERSITY OF LEEDS.—At the next degree ceremony in July the honorary degree of D.Sc. will be conferred on Dr. T. Wardrop Griffith, professor of medicine at Leeds from 1910 to 1925, and previously professor of anatomy from 1887.

EPSOM COLLEGE: *Sir Walter Buchanan Scholarship.*—The Council will shortly award this scholarship, of about £38 a year. It is primarily intended for the sons of deceased or prematurely invalided officers of the Indian Medical Service, but failing any such candidates, it may be granted to the sons of legally qualified medical men of wholly British parentage in necessitous circumstances who have practised medicine for at least five years in India. Forms of application may be had from the Secretary, Mr. J. B. Lamb, 49, Bedford-square, London, W.C.1.

LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—Sir Humphry Rolleston will open a symposium on Some Diseases of the Jews, at 3 P.M. on Thursday, June 13th, at the London Jewish Hospital, Stepney Green, E.

RESEARCH DEFENCE SOCIETY.—The annual general meeting of this Society will be held at 11, Chandos-street, Cavendish-square, W., on Wednesday, June 12th, at 3 P.M., with Lord Lamington in the chair. Prof. A. V. Hill will deliver the Third Stephen Paget Memorial Lecture, entitled Enemies of Knowledge.

INDIAN MEDICAL SERVICE DINNER FUND.—The annual dinner of the Indian Medical Service will be held at the Trocadero Restaurant, Piccadilly-circus, London, on Wednesday, June 19th, at 7.15 P.M. Further information is obtainable from the joint Hon. Secretary, Sir Thomas Carey Evans, 31, Wimpole-street, W.1.

AUSTRALIAN AND NEW ZEALAND MEDICAL ASSOCIATION IN ENGLAND.—The summer dinner of this Association will be held at the Trocadero Restaurant, Piccadilly, on Friday, June 14th, at 7.45 for 8.0 P.M. Mr. F. F. Muecke will preside, and Mr. Sampson Handley and Prof. F R. Fraser will be the official guests of the Association. All medical visitors from Australia and New Zealand, whether members of the Association or not, are invited to be present, and guests may be brought. Communications should be addressed to Mr. P. J. Jory, 26, Queen Anne-street, London, W.1.

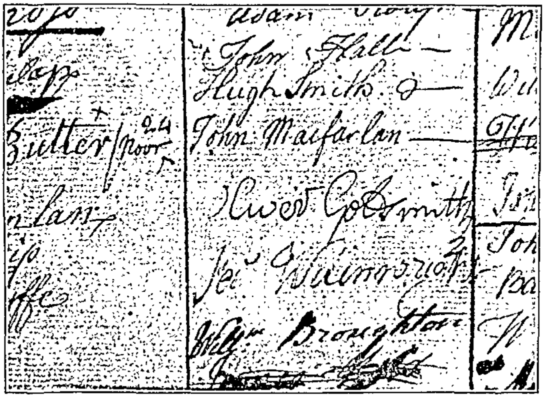
SOUTH AFRICAN MEDICAL ASSOCIATION: ANNUAL CONGRESS.—The scientific meeting was opened at Port Elizabeth on May 13th by the Hon. A. P. J. Fourie. Dr. A. J. Orenstein inducted Dr. R. M. Leith into the Presidential chair. In doing so he observed that it could be said with truth that a country got the medical profession it deserved. Not only did the enlightenment of a country react in a subtle way on the medical men practising in it, but the work of progressive and altruistic practitioners could be so hampered by ill-conceived legislation, and by the apathy of public bodies as to reduce its potentiality for public service to a lamentably low level. Dr. Leith spoke of the ability of the medical profession to instruct and enlighten a public which was becoming increasingly interested in health matters, and ready to learn. But there was need, he said, for the profession first to educate themselves more on the preventive side. The student had been taught to regard the diagnosis and treatment of established disease as the important thing, and prevention had not always been sufficiently stressed in their training.

Notes, Comments, and Abstracts.

THE BICENTENARY OF THE BIRTH OF OLIVER GOLDSMITH, M.B. DUB. & OXF.

BY SIR WILLIAM HALE-WHITE, K.B.E., M.D., LL.D.,
CONSULTING PHYSICIAN TO GUY'S HOSPITAL.

GOLDSMITH is usually said to have been born on Nov. 10th, 1728, but some think that a rather later date is more likely, and a later date is given on the memorial in Westminster Abbey, so the present time is near enough for us to call attention to the bicentenary of his birth. He was a physician of whom our profession may well be proud, for he wrote the best comedy in our tongue, and Goethe said: "It is not to be described the effect that Goldsmith's 'Vicar' had upon me, just at the critical moment of mental development. That lofty and benevolent irony, that fair and indulgent view of all infirmities and faults, that meekness under all calamities, that equanimity under all changes and chances, and the whole train of kindred virtues, whatever names they bear, proved my best education; and in the end these are the thoughts and feelings which have reclaimed us from all the errors of life." All Goldsmith's writings are beautiful English, much of the "Vicar of Wakefield" has become part of our common speech. He was loved by everybody. Burke wept when he heard of his death, and Reynolds put aside his painting for the day.



John Hall

Hugh Smith

John Macfarlan

Oliver Goldsmith

Wm Broughton

Oliver Goldsmith's signature, in the entrance book of the Royal Medical Society of Edinburgh, Jan. 13th, 1753. For this I am indebted to Dr. J. D. Comrie, lecturer on the History of Medicine, University of Edinburgh.

Medical Education.

No consecutive account of him as a physician has been published.* His father, a clergyman, first at Pallas, then at Lissoy, near Athlone in Ireland, was so poor that, although his elder son Henry had gone to Trinity College, Dublin, as a pensioner, Oliver was sent as a sizar, he had an unhappy time there. He attended some anatomy lectures and took his A.B. degree on Feb. 27th, 1749, after which he returned home. It was discussed whether he should be a lawyer or a parson; he tried to go to America, but went for a walk while his ship, at Cork, was waiting for a wind, which sprang up suddenly, and the ship sailed before Oliver could get back to it. The M.B. degree of Dublin could not be taken after the A.B. until three years had elapsed, so the earliest date at which Goldsmith could take it was 1752. When he actually took it is not certain; Percy says when he was about 20—*it must have been before 1763 for, in an agreement* with "Dodsley," written by Goldsmith in that year and now in the British Museum, he calls himself M.B. Clarke thinks he most likely took it between 1756 and 1763. It will be seen later there is no doubt he did take it. His father had died while he was at college, but his uncle, the Rev. Thomas Contarine, who had married his father's sister, gave him much of the necessary money to study medicine at Edinburgh, where he entered as a medical student in the autumn of 1752. In the class rolls of Prof. Munro is the entry that Oliver Goldsmith joined the class for anatomy at the end of October, 1752, and again at the end of October, 1753, in each case paying three guineas.

He writes[1] to his brother-in-law, Daniel Hodson, saying that during the day he has to attend lectures, at night he is in his lodging with hardly any society but a folio book, a skeleton, his cat, and a meagre landlady. He pays 23 pounds a year for diet, washing, and lodging, which is the cheapest to be got in Edinburgh; he reads hard, which he never could do if the subject was displeasing. The letter concludes: "Direct me to Surgeon Sinclair's in the Trunk Close, Edinburgh." This was a short street in old Edinburgh, going between the High-street and the open space *around the old physic garden. After he has been in Edinburgh* some seven months we find a letter from him to his uncle Contarine, telling that except for knowing a few who attend Munro's lectures, he is a recluse. "I shall give you the Professors' names and, as far as occurs to me, their characters, and the first as most deserving is Mr. Munro, Professor of Anatomy. This man has brought the science he teaches to as much perfection as it is capable of, and not content with barely teaching anatomy he launches out into all branches of physic, where all his remarks are new and useful. 'Tis he, I may venture to say, that draws hither such a number of students from most parts of the world, even from Russia; he is not only a skilful physician but an able orator, and delivers things in their nature abstruse in so easy a manner that the most unlearned may, must understand him; Plumer, Professor of Chemistry, understands his business well, but delivers himself so ill that he is but little regarded; Alston, Professor of Materia Medica, speaks much but to little purpose; the Professors of Theory and Practice say nothing but what we may find in the books laid before us and speak in so droneing and heavy a manner that their hearers are not many degrees in a better state than their patients." After giving this impression of the Edinburgh teachers, he says he shall go to Leyden; he clearly enjoys his studies, for—"I read a science the most pleasing in nature so that my labours are but a relaxation and I may truly say the only thing here that gives me pleasure."

The Royal Medical Society,[2] an ancient students' society in Edinburgh which still exists, admitted Goldsmith as a member in its sixteenth session, for his signature with ten others appears among those who were admitted on Jan. 13th, 1753 *(see figure). Some of his biographers infer that he was* distinguished by not having to read a paper on his admission, but this is not so, for members read their papers some time after admission. He was remembered favourably by the celebrated Black, and we know that several of his fellow students conceived a regard for him. Everything goes to show that at Edinburgh he worked hard at medicine, was interested and happy in it. He relaxed, for he took a *month's trip into the Highlands; he observed the people* when he wrote his famous "description of this unfruitfull country" to his cousin, Robert Bryanton, and he "spent more than a fortnight every second day at the Duke of Hamilton's, but it seems they like me more as a jester than as a companion; so I disdained so servile an employment; it was unworthy my calling as a physician."

His expenses in Edinburgh were paid by his uncle Contarine, his sister Mrs. Hodson, and his brother Henry; he lived honourably within his means; he "was obliged to buy everything since I came to Scotland, shirts not even excepted." His tailor's bill for the year 1753 was what Forster calls[3] "the not very unmoderate sum" of £9 11*s.* 2½*d.*; it included hose and hats, and shows that he liked sky-blue and claret colours. His letters indicate grateful affection for the kindness of his relatives, and in the last letter he sent to his uncle before leaving Edinburgh, he says: "As I shall not have another opportunity of

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* Since writing this I learn that Dr. T. P. G. Fitzpatrick has recently given a lecture in Dublin on Goldsmith's Connexion with the Medical Profession.

The Differential Diagnosis of Splenomegaly with the Treatment of the Diseases Concerned. Frid., Dr. L. S. T. Burrell: Bronchiectasis, Abscess of Lung, and Empyema.—QUEEN MARY'S HOSPITAL, Stratford, E., Wed. at 2.30 P.M., Dr. A. A. Osman: Debility in Children and Adults. No fee.—ROYAL EAR HOSPITAL, Huntley-street, W.C., Thurs., 2 P.M., Mr. E. A. Peters: Aural Demonstration. No fee.—ROYAL WESTMINSTER OPHTHALMIC HOSPITAL, Broad-street, W.C. Course in Ophthalmology. Every afternoon. Clinical work and lectures.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. Course in Gynæcology. Afternoons and some mornings. Operations and lectures. Two weeks' Course.—VICTORIA PARK HOSPITAL, E. Special Course in Diseases of the Chest for two weeks. All day course, lectures, special demonstrations, and operations.—Further particulars from the Fellowship of Medicine.

UNIVERSITY COLLEGE, Gower-street, W.C.

MONDAY, June 10th.—5 P.M., Prof. R. Chambers (New York): Some Aspects of the Protoplasmic Membrane. (Free Public Lecture.)

NATIONAL HOSPITAL, Queen-square, Bloomsbury, W.C.

MONDAY, June 10th, 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Kinnier Wilson: Neurological Complications of the Acute Specific Fevers.

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Mr. Donald Armour: Head Injuries.

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Purdon Martin: Hysteria.

FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Sir Percy Sargent: Cervical Ribs.

EAST LONDON HOSPITAL FOR CHILDREN, Shadwell, E.

WEDNESDAY, June 12th.—4.15 P.M., Clinical Meeting. There will be a discussion on Neurological Diagnosis in Children, followed by demonstration of cases of interest in the wards. Tea served at 4 P.M. All practitioners are cordially invited.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

TUESDAY, June 11th.—3.30 P.M. (at the Jessop Hospital): Prof. Phillips: The Early Diagnosis of the Cervix.

FRIDAY.—3.30 P.M., Mr. Cobb: Complications of Middle-ear Disease.

Appointments.

BROWN, R. CHRISTIE, M.S. Durh., F.R.C.S. Eng., has been appointed Obstetric Surgeon to the City of London Maternity Hospital.

WILSON, ARTHUR J., M.D. Edin., Honorary Physician, Coventry and Warwickshire Hospital.

King Edward VII.'s Convalescent Home for Officers, at Osborne, I.O.W.—WALLACE, Sir CUTHBERT, M.B., B.S. Lond., F.R.C.S. Eng.; GASK, G. E., F.R.C.S. Eng.; CHOYCE, C. C., M.D., Ch.B. Edin., F.R.C.S. Eng.; CARLING, E. R., M.B., B.S. Lond., F.R.C.S. Eng.; WILLCOX, Sir WILLIAM H., M.D. Lond., F.R.C.P. Lond.; MILLER, C. H., M.D. Camb., F.R.C.P. Lond.; FLETCHER, H. MORLEY, M.D. Camb., F.R.C.P. Lond.; and PURVES-STEWART, Sir J., M.D., C.M. Edin., F.R.C.P., have been appointed to the Consulting Staff.

Vacancies.

For further information refer to the advertisement columns.

Birkenhead County Borough.—Res. Asst. M.O. £450.

Birmingham, City Hospital for Infectious Diseases, Little Bromwich.—4th Asst. M.O. £300.

Birmingham, Selly Oak Hospital.—Cas. O. At rate of £200.

Bootle, Borough Hospital, Derby-road.—Hon. Dental Surgeon.

Bristol General Hospital.—Hon. Clin. Assts.

Buxton, Devonshire Hospital.—Asst. H.P. At rate of £150.

Cambridge, Addenbrooke's Hospital.—Res. Anæsthetist. Also H.P. At rate of £180 and £130 respectively. Also H.S. At rate of £130.

Coventry and Warwickshire Hospital.—Hon. Asst. P. Also Res. H.S. £125.

Derby, Derbyshire Hospital for Women.—H.S. £150.

Dewsbury and District General Infirmary.—H.S. £200.

Dreadnought Hospital, Greenwich. S.E.—H.P. and H.S. Each at rate of £110.

Dublin, Dr. Steevens' Hospital.—Res. Surgeon.

Dudley Guest Hospital and Eye Infirmary.—H.S. Also Asst. H.S. £175 and £150 respectively.

Dunedin, N.Z., University of Otago and Dunedin Hospital.—Sen. Res. Surg. O. £500.

East London Hospital for Children, &c., Shadwell, E.—Res. H.S. At rate of £125.

Exeter, Devon Mental Hospital, Exminster.—Jun. Asst. M.O. £300.

Exeter, Royal Devon and Exeter Hospital.—Asst. H.S. At rate of £100.

Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—Res. Surg. O. At rate of £175.

Great Yarmouth General Hospital.—Jun. H.S. £100.

Grimsby and District Hospital.—H.S. £250.

Grosvenor Hospital for Women, Vincent-square, Westminster, S.W. Hon. Gyn. Surg.

Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—H.S. Also H.P. Each at rate of £100.

Ilford Borough.—Asst. M.O.H., &c. £450.

Kensington, Fulham and Chelsea General Hospital, 194, Finborough-road, Earl's Court, S.W.—Res. Cas. M.O. At rate of £100.

Lancs County Council, High Carley Sanatorium, Ulverston.—Asst. Tub. M.O. £450.

L.C.C. Mental Hospital Service.—8th Asst. M.O. £300.

London Hospital, E.—Cardiographic Department. Paterson Research Scholar. £400.

London Temperance Hospital, Hampstead-road, N.W.—Cas. O. At rate of £120.

Lowestoft and North Suffolk Hospital.—H.S. £120.

Manchester, Ancoats Hospital.—Assist. Pathologist. £150.

Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Sen. Res. M.O. At rate of £125. Also Radiologist.

Manchester, Salford Royal Hospital.—H.P. Also 3 H.S.'s to Special Departments. Each at rate of £125.

M.A.B., Infectious Hospitals Service.—Jun. Asst. M.O.'s. Each £500.

M.A.B., Sutton, Surrey, Antitoxin Establishment, Belmont Laboratories.—Bacteriologist. £700.

Ministry of Health, Whitehall, S.W.—M.O. £600.

Newcastle-upon-Tyne, Royal Victoria Infirmary.—Res. M.O. £250.

Nottingham, Harlow Wood Orthopædic Hospital, near Mansfield.—Res. Surg. O. £250.

Norwich, Norfolk and Norwich Hospital.—H.S. £120.

Oswestry, Shropshire Orthopædic Hospital.—Locum Tenens H.S.

Perth Royal Infirmary.—H.P. Also Jun. H.S. Each £75.

Princess Louise Kensington Hospital for Children, N. Kensington. Hon. Assist. Surgeon to Ear, Nose and Throat Dept.

Prison Medical Service, Home Office, S.W.—M.O. Class II. £350.

Queen's Hospital for Children, Hackney-road, E.—Surgeon to Ear, Nose and Throat Dept.

Rochdale Infirmary and Dispensary.—Jun. H.S. £175.

Royal Free Hospital, Gray's Inn-road, W.C.—Clin. Assts. to Special Depts.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.P. At rate of £100.

St. Andrew's Hospital, Dollis-hill, N.W.—Hon. Surgeon to Ear, Throat and Nose Dept.

Sheffield, Lodge Moor Hospital.—Res. M.O. £350.

Sheffield, Royal Hospital.—Residents. At rate of £80.

Sheffield Royal Infirmary.—H.S. £80.

Sheffield Union Hospital, Firvale.—Res. Asst. M.O. £250.

South Shields, Ingham Infirmary.—Sen. and Jun. H.S. £200 and £150 respectively.

Southern Rhodesia Medical Service.—M.O. £500.

Stockport Infirmary.—H.S. £175.

Sudan Government Medical Dept.—Two M.O.'s. LE720.

Swansea Hospital.—H.P. £150.

Truro, Royal Cornwall Infirmary.—H.S. £170.

Tunbridge Wells and Counties General Hospital.—H.S. £160.

Warrington Infirmary and Dispensary.—H.P. At rate of £150.

Watford Peace Memorial Hospital.—Res. M.O. At rate of £150.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Grimsby (Lincs).

Births, Marriages, and Deaths.

BIRTHS.

EDMOND.—On May 29th, at The Crescent, Shrewsbury, the wife of William Edmond, F.R.C.S., of a daughter.

HOLMWOOD.—On May 26th, at Aldermaston, Berks, the wife of L. S. Holmwood, M.R.C.S., of a daughter.

LAWRENCE.—On June 1st, at a London nursing home, the wife of Dr. R. D. Lawrence, of Harley-street, of a son.

SANSOME.—On May 31st, at Sandwell House, West Bromwich, the wife of T. Heywood Sansome, M.B., Ch.B., of a daughter.

THOMSON.—On May 24th, the wife of Dr. Hugh Thomson, Musgrave Hall, Penrith, of a son.

WILSON.—On May 28th, at Frognall-lane, Hampstead, N.W., the wife of Dr. R. McNair Wilson, of a son.

MARRIAGES.

LAWSON—BLUNDELL.—On June 3rd, at St. Pancreas Church, N.W., Donald B. C. Lawson, M.B., Ch.B., to Catherine Mary, only daughter of Mr. and Mrs. Robert C. Blundell, of Taviton-street, Gordon-square, W.C.

MICHAELIS—SCHWAB.—On May 28th, Theodore David Michaelis to Elisabeth Henrietta Schwab, M.D., B.S., daughter of Mr. and Mrs. S. M. Schwab, of Glenloch-road, Belsize Park.

DEATHS.

BOWES.—On May 28th, at Dormer Cottage, Devizes, John Ireland Bowes, M.R.C.S., in his 80th year.

BRANTHWAITE.—On June 2nd, at 16, Percival-road, Clifton, Bristol, Robert Welsh Branthwaite, C.B., M.D., D.P.H., Director of Medical Services, Stoke Park Colony, Bristol, and late Commissioner, Board of Control, aged 70.

KENNEDY.—On May 13th, at Alassio, William Willoughby Kennedy, M.A. Glasg., M.B. Lond., D.P.H. Camb., M.D. Lond., aged 66.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

court of tumble-down houses and many lines of clothes hanging out to dry. The keeper of this wretched house—Goldsmith had but one chair—was taken by bailiffs, the lodger was in debt for rent, so the gay suit bought for the examination was pawned and the four books for review were pledged for a loan from a friend. Directly this was done a note from Griffiths arrived, demanding repayment, and Goldsmith wrote to him a letter, "the most interesting of all the Goldsmith papers that have been preserved to our time."

During the next few years his chief work was writing, but he saw a patient or two, for in a beautiful essay called "The Indigent Philosopher,"[4] written in 1762, he tells that he had just returned from the funeral of his friend, Sir William Abner. "I attended him as his friend and Physician during his last illness. I soon saw that he was dying, and was glad of it. He was leaving a world unfit for him."

In 1765 Reynolds told Goldsmith that it would be a good thing if he had a regular calling and was both a physician and a man of letters, consequently he dressed up in purple silk small-clothes, a handsome scarlet roquelaure, a full dress wig, a sword and a gold-headed cane, but the physician did not like it, for, said he, "here am I shut out of several places where I used to play the fool very agreeably." He tried practice for six months and had a patient, Mrs. Sidebotham; she, when her physician differed from her apothecary, sided against the physician, who thereupon left the house in high indignation. This appears to have been the end of his attempts to practise, although, as he was almost always known as Dr. Goldsmith, as Hawes calls him a brother practitioner, and as while in "Jupiter and Mercury" Garrick leaves out the doctor in speaking of Goldsmith as "this scholar, rake, Christian, dupe, gamester, poet," there is much about him as a doctor in Garrick's prologue to "She Stoops to Conquer," it is quite possible that he may have occasionally seen some patients for the rest of his life. This suggestion would also explain why he took his M.B. at Oxford. On Tuesday, Feb. 14th, 1769, Johnson, Percy, and Goldsmith went to Oxford, they dined at University College, Queen's, and Trinity, and *Jackson's Oxford University Journal* for Saturday, Feb. 18th, 1769, says: "Yesterday Oliver Goldsmith Esq., Bachelor of Physic of the University of Dublin . . . was admitted in congregation to the same degree in this University."[5]

Medicine in Goldsmith's Writings.

Be this as it may, Goldsmith certainly did not now greatly care for the profession of medicine, and he wrote so much on general topics that he cannot have had time for it; the catalogue of his books which were sold at his death contains hardly any on medicine, and the reader of his works will find few references to medicine, and nearly all that can be found are so vague that they might have been written by an author who was not a doctor. The parson and schoolmaster, but not the doctor, are described in "The Deserted Village," the only reference to him in "The Vicar of Wakefield" is in Chapter III.: "Physicians tell us of a disorder, in which the whole body is so exquisitely sensible, that the slightest touch gives pain." He is not mentioned in "She Stoops to Conquer," but in the intended epilogue Goldsmith wrote:—

"Doctors who cough and answer every misfortuner,
'I wish I'd been call'd in a little sooner.'"

In "An Enquiry into the Present State of Polite Learning in Europe," the only sentence that even suggests that the author is a doctor is in Chapter XII. "In an infirmary, the student who only attends to the disorders of a few patients is more likely to understand his profession than he who indiscriminately examines them all." "The Man in Black" is autobiographical, but there is no reference to medicine in it, nor is there in the rest of the "Citizen of the World," but in *The Bee*[6] we find in the article on Education this invaluable advice for children, "No luxurious dishes with high seasoning, nothing given to children to force an appetite, as little sugared and salted provisions as possible, though never so pleasing; but milk morning and night, should be their constant food . . . it corrects any consumptive habits." Modern research has indeed vindicated Oliver. In a review of "Philosophical Miscellanies on Various Subjects," by M. Formby,[7] Goldsmith shows that he has read some physiology, for the speaks of the secretion of sweat and the relation of the cerebrum to voluntary motion, and when writing of the inhabitants of different climates he also mentions the secretion of sweat.[8] In the Epilogue to "The Good Natured Man" (published in 1767) we find:—

"No no, I've other contests to maintain;
To-night I head our troops at Warwick Lane."

This refers to the fact that in 1767 the Licentiates of the Royal College of Physicians which was then in Warwick-lane, marched in a body to the College, demanding to be present at Comitia meetings. The President and Fellows locked themselves in, but the Licentiates hired a blacksmith to force the door and filled the College. Sir William Browne, the President, dissolved the Comitia.‖

There were two subjects, hydrophobia and quacks, about which Goldsmith wrote a good deal, no doubt because, being a physician, he was interested, but what he wrote does not show any special knowledge: it might have been equally well-written had he not been a doctor. It is difficult for us to conceive the fearsome, justifiable dread that our ancestors had of hydrophobia, always fatal and the most terrible of deaths, as I know from having seen persons die of it. Medical writings of the eighteenth century are full of cases and of supposed cures. Dogs were killed by hundreds. Goldsmith tried hard the humane task of alleviating the horrible fear, chiefly by pointing out that the bite of a dog often did not kill. This was true, for the dog might not be mad, and if he were, the bite was usually harmless when through the clothes, for they absorbed the poisonous saliva, thus:—

"And while they swore the dog was mad
They swore the man would die
But soon a wonder came to light
That show'd the rogues they lied
The man recover'd of the bite
The dog it was that died."

In letter Sixty-Nine of the "Citizen of the World" he ridicules the fear of mad dogs, and in the "Progress of the Arts in Switzerland"[9] he says "as we have been, frequently of late, teized with cures for the bite of a mad dog," and he goes on to say that pimpernel tea has been recommended, he describes how to make it, but expresses no opinion.

We have seen in a letter to his uncle, written from Edinburgh in 1753, that he speaks scornfully of quacks. They flourished in his time like weeds. They are ridiculed and satirised in letters Twenty-four and Sixty-eight of the "Citizen of the World": a doctor Rock§ is especially castigated. Inasmuch as James Powder was then considered a quack remedy, the general outcry against quacks was inflamed by Goldsmith's death and that of a Mr. Scawen.

He seems to have known some of the notable men in the medical profession, for he wrote humorous verses in reply to an invitation to dinner with George Baker, who became President of the College of Physicians, discovered the cause of lead colic, and did a large fashionable practice. His nephew, Mrs. Hodson's son, came to London and, on the advice of his uncle Oliver, studied medicine; his uncle wrote a letter introducing him to William Hunter, the original is in the possession of the Royal College of Surgeons. The uncle reported to Mr. Hodson that the student made good progress and that he had obtained for him the post of full surgeon in India. Katherine Balderston prints the following short note of Goldsmith's: "Dr. Goldsmith presents his compliments to Dr. Mackenzie, he will be at home this day till three, or at any other time the doctor shall appoint. Or he will wait upon him at Southwark. He is engaged to dinner every day for this six or seven days." I have tried, as others have done, to find out who this Dr. Mackenzie can have been, but I have not succeeded.

Thanks to Ronald S. Crane there has recently been brought to light the remarkable fact that Goldsmith[10] introduced Auenbrugger's discovery of percussion to England immediately upon the publication of his book in Vienna in 1761. Goldsmith gives an admirable abstract of the book, and concludes: "Such are the outlines of this new discovery; whether it may be of use to society or not, there is no necessity for me to pretend to determine, only this may be observed, that the lungs are often in the most healthy state, found to adhere to the pleura, and in such a case, I fancy the sound would, in that part, deceive the practitioner; however, I shall not pretend to set up my conjecture against his experience." Auenbrugger's discovery of percussion had to wait several years before it was generally recognised, this was not the fault of Goldsmith, and it is pleasant to think that an Englishman noticed it immediately, even before Roziere de la Chassagne, to whom the credit is usually given.[11]

Death of Goldsmith.

John Forster tells us that in 1762 Goldsmith was not well and went to Tunbridge and Bath, that he was severely ill in 1772 with strangury from which he obtained relief by James' powders, about which he became a bigot. He arrived in London in the middle of March, 1774, having recovered from a recurrence of his disease, but on March 25th he took to his bed in his chamber in Brick Court, where his bedroom was a closet without any light in it. This fatal illness led to so much controversy, that his loving friend,

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‖ I am indebted to Dr. Arnold Chaplin for this information For a full account of the dispute, see "Medicine in England During the Reign of George III.," by Arnold Chaplin, M.D., London, 1919.

§ For an account of Rock see "The Quacks of Old London," by C. J. S. Thompson, London, 1928.

William Hawes,[¶] the apothecary, called in to attend him, published a pamphlet, "An Account of the late Dr. Goldsmith's Illness so far as relates to the Exhibition of Dr. James' Powders," by William Hawes, Apothecary, London, 1774. He dedicated it to Sir Joshua Reynolds and Edmund Burke. In the dedication he says: "I have reason to believe some persons have formed very unjust and uncandid notions respecting my conduct in the affair." Hence the pamphlet. Hawes tells us that Goldsmith sent for him at 11 P.M. on Friday, March 25th, 1774. The patient had violent, intensive frontal headache, no pain elsewhere, no shivering, a moist tongue, pulse 90. He told Hawes that he had taken two ounces of ipecacuanha wine as a vomit, and that he desired to take James' powder. Hawes said he thought this would do harm and suggested an opiate. Goldsmith was obstinate, and Hawes remarks on the difficulty of treating a brother practitioner. The argument lasted half an hour, Goldsmith would not give way, so Hawes had to say that the taking of the James' powder would be without his approbation, and he suggested calling in Dr. Fordyce; this led to more argument, but finally Goldsmith consented. Fordyce went the same night and by the time he reached Goldsmith's chambers the patient had already taken two or three doses of the powder, which had operated as a purgative and emetic. Fordyce disapproved of the taking of the powder.

Hawes went to see Goldsmith the next (Saturday) morning and was told he was dozing, and so did not go up to him, but called in the evening, when he found him very ill with great diarrhœa and vomiting, and his servant said that Goldsmith had continued to take James' powder; he was much reduced and his pulse was very quick and small. Goldsmith said to Hawes, in a low voice, "he wished he had taken my friendly advice last night." He seemed to have neither spirits nor strength to speak more. The same evening Dr. Fordyce called on Hawes and said that Goldsmith had done himself such injury by taking James' powder that he proposed to call in Dr. Turton. At 8 A.M. on Sunday morning Hawes went again and found the patient much worse, very weak, much vomiting and diarrhœa; with Goldsmith's consent he sent for Turton. Drs. Fordyce and Turton met at the time appointed to assist at a consultation, which was continued twice a day till the patient died on April 4th, 1774.

After Goldsmith's death paragraphs appeared in the papers[**] ascribing it to James' powders; this aroused replies in the *Morning Post*, which published accounts of his illness from Mary Ginger, wife of the head porter of the Inner Temple, who attended on him for the last five years of his life; Sarah Smith, the nurse who nursed him in his fatal illness and John Eyles (his servant), all of whom declared that the patient had much less James' powder than Hawes states and that he was very angry with Hawes because he had sent powders which were not James' powders. Mary Smith says that at the funeral Hawes said that James' powder was the occasion of death. A letter from Sal. Glauberi attacks Hawes in such wretched taste that I instinctively distrust the writer; he is answered temperately by another correspondent. Francis Spilsbury,[12] who, although he defends the use of quack medicines and abuses Hawes, concludes that Goldsmith's death was "owing to an undeniable and demonstrated injudicious use of James' powder," and later on he says: "Therefore I will not deny that to them (James' powders) the death of Dr. Goldsmith may be imputed." Reading the available documents, the impression given is that there is not sufficient evidence to determine the primary illness, that death was much accelerated by antimony poisoning,[††] that Hawes' is a fair account; that probably the proprietors of James' powder were afraid that Goldsmith's death would lessen the sale of the powders, and that Hawes was trusted by Goldsmith's friends for, after the death, Reynolds and Burke honoured him with the management of the disposition and sale of Goldsmith's furniture and books, and Maurice, Oliver's brother, warmly thanked him for all that he had done.

[¶] A greatly respected, able man, physician to the London Dispensary. He did much work on the resuscitation of the apparently drowned, he founded the Royal Humane Society, and published "An Examination of the Rev. John Wesley's Primitive Physic." See Gentleman's Magazine, 1808, lxxviii., 1121.

[**] The copy of Hawes' pamphlet in the Royal Society of Medicine Library has some of these newspaper cuttings bound up with it.

[††] Kenrick, one of Goldsmith's enemies, actually suggested that he committed suicide by taking the powder.

References.

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5. Clarke, Sir Ernest: Proc. Roy. Soc. of Med., History of Medicine Section, Jan. 28th, 1914.
6. The Bee, No. 6, Nov. 10th, 1759.
7. The Critical Review, June, 1759.
8. The Royal Magazine, 1760.
9. Public Ledger, August 29th, 1761.
10. Public Ledger, August 27th, 1761; for references 6, 7, 8, 9, and 10, see Crane, Ronald, op. cit.
11. THE LANCET, 1924, i., 263.
12. Spilsbury, F.: Thoughts on Quacks, 2nd ed., London, 1777.

DIAGNOSIS OF MENOPAUSE.

To the Editor of THE LANCET.

SIR,—Most medical practitioners agree that the signs and symptoms usually associated with the menopause are so vague that a sharply defined diagnosis is often impossible. In my own experience I have found certain signs to be definitely associated with the menopause, and I should be grateful if other investigators could inform me if they have observed them. In certain cases the condition of the hands has arrested my attention; on examination they appear to be painted with red pigment on the palmar aspects—on the fingers near their tips, the radial aspects of the thumbs on the terminal phalanges, the thenar and hypothenar eminences, and above the creases on the wrists. In other words, the condition can be imitated by placing the palmar aspects of the hands lightly (and as if by accident) on a table smeared with "wet paint" and immediately withdrawing them. The condition is transient, while the usual pressure signs mark it as vascular.

I am, Sir, yours faithfully,

Dublin, May 29th, 1929. JOHN V. RYAN M.B., B.Sc.

ON GOAT KEEPING.

THE British Goat Society's Year Book for 1929 is now in its ninth annual issue and contains much useful information for keepers and breeders. There are several contributions by medical men. Dr. W. Ker Bell has an interesting note on Goats' Milk and the Value of its Calcium Content, while Mr. F. E. Corrie, B.Sc., discusses the value of the iodine content of milk both to the goat and the drinker of its milk, such content being controlled by the food supply. Dr. R. T. Leiper, F.R.S., Director of the Institute of Agricultural Parasitology, deals with the Internal Parasites of the Goat, pointing out that the worm infestations accumulate in the animals not by multiplication inside but by the addition of new parasites to the feeding grounds of the goat due to accumulative droppings. "If one could find a drug" says Dr. Leiper, "which would at a single dose remove all the parasites from the inside of the goat, the animal would again become infected very soon from the young stages in the grass in its paddock." Speaking of the two aspects of the Institute's work, prevention and treatment by new methods, Dr. Leiper sees in their coöperation the ultimate relief of suffering. Among other articles of interest are the Constituents of Food and their Fate in the Animal Body by Mr. A. B. Orr, M.R.C.V.S., Goats' Milk as a Food by Mr. J. C. Urquhart and Mr. F. Knowles, and the Mechanics of Digestion by Mr. H. Stainton, F.R.C.V.S. The annual, which is well illustrated, contains the rules and regulations of the British Goat Society, a list of judges for the year, and the names and addresses of members. It can be obtained from the hon. secretary, Mr. Thomas W. Palmer, 10, Lloyd's-avenue, London, E.C.3., price 1s. 6*d*.

THE NON-FRENCH WINES.

WHILE France is par excellence the country which produces the most satisfactory as well as the most beautiful wines known to us, many claim that Germany, with its hocks and moselles, offers at least as high and delicate an invitation to the palate as anything that Bordeaux or Bourgogne can give, while Portugal and Spain make claims of high character on different grounds, and the wines of Italy, especially as drunk in Italy, have qualities of their own which win them many admirers. Mr. Shand, who has already written on food and wine generally, and an excellent book upon French wines,[1] now introduces us to a category of the wines of Portugal, Spain, Germany, and Italy, and also of Switzerland, Austria, Hungary, and the new state of Czecho-Slovakia, and, lastly, of the British Empire. He sets out under each wine its claims and its qualities, and in many cases the mass figures of its production, giving the reasons for his judgments and also much useful information of a general character. A valuable glossary is added. The book will be found a practical work of reference and will also help doctors in advising patients as to their diets.

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[1] A Book of Other Wines than French. By P. Morton Shand. London: Alfred A. Knopf. 1929. Pp. 185. 10*s*. 6*d*.

Croonian Lectures

ON

SOME CHEMICAL FACTORS IN THE CONTROL OF THE CIRCULATION.

Delivered before the Royal College of Physicians of London

BY H. H. DALE, M.D. CAMB., F.R.C.P. LOND., F.R.S.,
DIRECTOR OF THE NATIONAL INSTITUTE FOR MEDICAL RESEARCH.

LECTURE II.*

LOCAL VASODILATOR REACTIONS.—HISTAMINE.

(Delivered on June 6th, 1929.)

HISTORICAL.

I THINK it will be helpful to appreciation of the present position of the evidence on the physiological significance of histamine if I very briefly sketch the history of our knowledge of that substance from the beginning.

Histamine, which can be regarded chemically as the amino-acid histidine deprived of a molecule of carbon dioxide, was first made synthetically, as a chemical curiosity, by Windaus and Vogt.[1] The first hint of its physiological interest was obtained when Barger and I[2] were seeking for a principle in certain ergot extracts, which we had recognised by its potent stimulating property on the muscle of the isolated uterus, associated, apparently, with a pronounced depressor action, when administered intravenously to a cat, Barger isolated a small quantity of this substance in pure form; and the fact that Ackermann[3] had simultaneously shown that certain bacteria decarboxylate histidine, helped us to identify our substance from ergot as the base now known as histamine. When Laidlaw and I[4] came to investigate its action in detail, the remarkable resemblance between its effects in different species and those which, in the same species, had then recently been described as characteristic of the anaphylactic shock, soon became clear. It became clear also that, in each species, the corresponding physiological complex was produced by various organ extracts and products of protein digestion, in which the presence of unknown "depressor principles," lowering the mammalian arterial pressure by an incompletely analysed reaction, had long been recognised. The presence of such a "depressor" substance, in addition to the specific pressor principle, had been observed in pituitary extracts by Schafer and Vincent.[5] Oliver and Schafer[6] had obtained a "depressor" action with extracts of thyroid gland, Mott and Halliburton[7] with extracts of brain and nervous tissues, Vincent and Sheen[8] with extracts of liver, muscle, and various glandular organs. The substance first suspected as the cause of this activity was choline, and we shall see later that a choline action does contribute largely to the total vasodilator action of certain organ extracts, and has its own special physiological interest. Vincent and Sheen, however, finding that the extracts which they were examining retained a large part of their depressor action after atropine had been administered, rightly concluded that choline was not the chief agent responsible.

At the time when Laidlaw and I were investigating the action of histamine, the action of Bayliss and Starling's secretin was in the centre of physiological interest. This extract of the intestinal mucosa, like other organ extracts, had been found by them to contain a powerfully depressor substance, distinct from the hormone of pancreatic secretion. The opportunity was taken of investigating this depressor agent, and Barger and I[9] actually obtained at that time, from an extract of intestinal mucosa, a small quantity of pure histamine. The significance of this, however, was far from clear. On the one hand, the amount isolated represented only a very small proportion of the activity of this type in the original extract; and, on the other hand, the histamine had been obtained from such a source that contamination with intestinal contents, in which histamine would certainly be produced by bacterial action, could not be excluded. The observation, in any case, remained for some years an isolated one; and such evidence as accrued in this interval was on the whole against the identification with histamine of the unknown depressor principle, the so-called "vasodilatin," so readily yielded, to simple extraction with water or alcohol, by most of the organs and tissues of the animal body. On the one hand it had been observed, for example by Stern and Rothlin[10] working with the spleen, that the principles occurring in natural organ extracts, while admittedly resembling histamine closely in their action, were apparently destroyed by chemical treatment to which pure histamine was completely resistant. On the other hand, by the time that Laidlaw and I resumed, about 1917, the physiological analysis of the action of histamine, in conjunction with Prof. Richards, of Philadelphia, the production of the "anaphylactoid" effect by intravenous injection of various substances had become familiar; and many of these had not the remotest chemical connexion with histamine. Such effects had been produced, for example, by salvarsan, by colloidal carbohydrates such as agar-agar, and by solutions of the heavy metals when these various agents were injected intravenously. We felt ourselves *driven to admit that community of the resulting* symptom-complex could provide no reason for inferring community, or even similarity, of chemical structure. As Laidlaw and I[11] wrote at that date: "The existence of these points of community, in the action of substances so utterly unrelated chemically as histamine and certain metallic ions, forbids any assumption that the production of similar effects, by unknown constituents of some organ or tissue, indicates the presence therein of histamine itself, or of any substance chemically related to it." I think we were right in deprecating such an assumption on the evidence then available; but, in the light of present knowledge, it is clear that we had not given proper weight to one possibility—namely, that the substance extracted from animal tissues might indeed be histamine, and that the metallic ions and the various colloids might produce similar effects on injection, by causing liberation of histamine by injury of the cells containing it.

The first definite claim to the chemical identification of histamine as the essential depressor constituent of a number of animal organs and tissues was made by Abel and Kubota[12] in 1919. Their evidence, unfortunately, failed to carry complete conviction. They actually isolated histamine salts from two of the many tissues investigated. One was the pituitary body. In this case the significance of their finding was complicated by two circumstances. Even the small quantity of histamine which they obtained was far too large to represent the depressor constituent of really fresh pituitary substance, and they wrongly supposed that they had obtained, and identified as histamine, the essential oxytocic principle of the posterior lobe. It was impossible to avoid the suspicion that the material which they used had undergone some putrefactive alteration. The other tissue was the gastro-intestinal mucous membrane, in which case their observation, substantially confirming the earlier one by Barger and myself, was open to the same criticism as ours had been. Abel and Kubota's work reopened the question of the presence and physiological significance of histamine in the living tissues; their conclusions, as more recent work has shown, were substantially correct; but the evidence left these conclusions open to doubt, and they met with no general acceptance.

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* Lect. I. appeared last week.

HISTAMINE AS A NORMAL CONSTITUENT OF MANY TISSUES.

The opportunity for the renewed activity of my own laboratory in the direct investigation of the depressor constituents of tissue extracts was created by circumstances having no immediate relation to our earlier work on histamine. Somewhere about the year 1926 interest arose, in more than one centre of investigation in Canada and the United States, in claims made for the injection of extracts prepared from the liver as a specific treatment of morbidly high arterial pressure. Dr. Best, of Toronto, who was due to spend some months in my laboratories, brought with him samples of the liver extract then being prepared and used in Toronto for the purpose mentioned, and showed us the method by which, at the time, the activity of the different batches of this extract was being physiologically controlled. We were not directly concerned with the therapeutic value of this liver extract. Samples of it were used, in carefully controlled therapeutic trials carried out in Sir Thomas Lewis's wards, by Dr. Iris Harmer, who failed to find evidence of genuine therapeutic value; and I think it may be assumed that this treatment has not justified the high hopes at one time entertained by its advocates. Our problem, however, was to discover, if possible, the chemical nature of the substances producing the immediate depressor action, which was being used in the laboratory as an index of the value of this extract; and our opportunity was created by the expectation of its value in therapeutics, which, for the time being, made it available on a large scale. Dr. Best and I had the advantage of coöperating with my chemical colleagues, Drs. Dudley and Thorpe.[13]

In the vasodilator activity of this extract we easily recognised two different factors—an action resembling that of choline, affecting the stronger arterioles, and an action resembling that of histamine, confined to the minute vessels and capillaries. We could make an artificial mixture of choline and histamine, indistinguishable in its action from the liver extract. Yet, on the chemical side, the properties of the principles producing these effects were difficult to reconcile with these physiological identifications. The principle acting like histamine, in particular, appeared to have some chemical properties quite unlike those of histamine. At several stages we had almost concluded, as have other workers with organ extracts, that it could not be histamine itself. We were only saved from this error by observing that, when histamine was added to the extract, its chemical behaviour showed similar anomalies; it now behaved like the natural vasodilator principle rather than like itself in plain watery solution.

Not to trouble you with details, I may say at once that we eventually isolated, from these alcoholic extracts of perfectly fresh liver, both choline and histamine; and we obtained them, not merely in sufficient quantities for complete chemical identification, but in such amounts, in relation to the activities of the original extract, as to make it unnecessary to suppose that any other more complex or unidentified principles contributed to the depressor, vasodilator action. Having reached this, at the time, unexpected conclusion concerning the liver extract, we turned our attention to the lung. I had long known that this organ yielded an extract having a peculiarly intense depressor action. We now found that the choline component in this action was relatively very weak. Almost the whole of the activity was of the histamine type, and we had comparatively little difficulty in isolating the histamine, again in such quantity as to make it unnecessary to suppose that any other more complex substance contributed to the activity of the original lung extract. Table I. shows the figures obtained, for the histamine contents of the liver and lung extracts, at different stages in the purification, by physiological estimates at all stages except the last, where the value given is the actual weight of histamine base contained in the pure dipicrate which was isolated. There is no ground for suggesting that the loss at any one stage is so disproportionately large as to indicate removal of a different active substance, or that, in any case, it is greater than was to be expected in the separation of a small quantity of the active base from a relatively enormous quantity of other materials.

TABLE I.—*Chemical Estimates of Histamine in Liver and Lung Extracts.*

	Crude extr.	After Pb A.	PWo Ppt.	Ag_2O Ppt.	Alk. alcohol	Cryst. dipicrate
Liver.						
(1) 60 kilo.	—	250	320	240	122	80·0
(2) 72 k.	300	—	280	204	140	133·0
Lung..						
(1) 0·5 k.	22	17	16	12·5	10	3·2
(2) 10 k.	750	530	460	400	300	287·0

Best, Dale, Dudley and Thorpe: Jour. Phys., 1927, lxii., 397.

Being able now with some confidence to assume that a histamine-like action of an organ extract was due to histamine itself, we could make a rapid survey of a number of organs, making extracts under standard conditions, and assaying them for histamine by the physiological method. Table II. shows figures obtained in this way and published by Dr. Thorpe.[14] Some of these estimates, particularly those made on the spleen, need revision in the light of more recent knowledge as to the intensity of the choline-like action which certain extracts may exhibit. In general, you will notice the relatively enormous histamine content of the lung, and the low position in the scale of skeletal muscle. The fact that, nevertheless, histamine was actually isolated and identified among the mass of basic constituents which muscle yields to extraction, is greatly to the credit of Dr. Thorpe's skill and tenacity. More recently Dr. Dudley has isolated histamine from spleen extract, again in sufficient quantity to account for the activity of this type shown by the extract.

TABLE II.—*Physiological Estimates of Histamine in Tissue Extracts.*

	Mgm. per kilo.		Mgm. per kilo.
Lung ..	.. 44, 75, 35.	Testis ..	.. 1·8.
Ovary..	.. 9.	Muscle..	.. 1, 1, 1·1, 1·4 (4·01).
Bladder	.. 7, 8.	Sub-maxillary..	0·5, 0·8.
Spleen	.. 7·5, 5.	Thyroid	.. 0·5.
Parotid	.. 5·3, 6·7.	Skin (Harris)	6.
Liver ..	.. 5·4, 5·0, 2·5, 6·6.	Epidermis „	24.
Kidney	.. 2·6, 3·3.	Dermis „	4.
Pancreas	.. 1·6, 3·0.		

Data mostly from Thorpe: Biochem. Jour., 1928, xxii., 94.

We were also able to test a question of great physiological interest—namely, whether the histamine which we thus extracted from a tissue, such as that of the lung, was present during life or formed rapidly after the death of the cells. We found that a lung taken from a living, anæsthetised animal, and frozen immediately in strongly cooled alcohol before mincing, yielded as much as the other lung, left for an hour or two in the dead body before removal. Best has recently shown that sterile autolysis of the tissue at body temperature is actually accompanied by the disappearance of histamine, through some action of which the nature is yet unknown. Histamine had evidently as good a claim to be regarded as a normal constituent of the living cell, as had any other substance which similarly conservative methods could extract. It must either preexist during life, or be formed in the very act of cellular death.

HISTAMINE AND LEWIS'S H-SUBSTANCE.

Our chemical investigation, having arrived at this point, obviously began to have an important bearing on the conclusions which Lewis and his colleagues were reaching independently. They had evidence that the living cells of the skin, when subjected to irritation or injury, liberated a substance with an action remarkably like that of histamine. We had shown that the cells, of all the organs which we had examined, yielded histamine itself to the simplest and most conservative methods of artificial extraction, and that all this histamine had apparently existed, in some form, in the living cell. The suggestion was obvious that the substance liberated by the living but injured cell, Lewis's H-substance, was histamine itself, not newly formed in response to the stimulus, but already existing in the cell-interior, and only becoming active on liberation. We had not indeed, and have not yet, obtained chemically identifiable histamine from skin; the technical difficulties of disintegrating the freshly separated, living skin, in sufficient quantity for such chemical work, have not yet been overcome. Harris,[15] however, in Lewis's laboratory, had no difficulty in proving that the skin of man and other mammals, extracted by processes similar to those which we used for other tissues, yielded a substance physiologically indistinguishable from histamine. Measurements in comparison with pure histamine solutions, with the use of such different physiological reactions as the depressor action on the cat's arterial pressure, the stimulant action on the isolated uterus of the guinea-pig, and the whealing effect on the skin of the human subject, gave concordant values. Harris also tested the question of the pre-existence of this substance in the skin cells, or its new formation on injury, by estimating the amount of the histamine-like substance present in normal cat's skin, and in a symmetrical, originally equal area rendered œdematous by scalding. The scalded skin had lost the H-substance in comparison with the normal; so that the result was in complete conformity with our own evidence, that the histamine extracted from a tissue exists preformed during life, and is not produced by post-mortem change.

So far the indications seemed to be all in favour of the identification of the substance released from living cells, in response to injury, with histamine, which can be so easily extracted from them by procedures involving their death. Lewis, in his book, while acknowledging the many points in favour of such an identification, prefers to refer to the substance liberated during life as the H-substance—a name designed to leave the question of identity open, while recognising the many suggestive points of analogy. It must be admitted that *complete* proof of the identity could only be obtained if the H-substance could be trapped, in œdema fluid or in blood or lymph leaving an injured area, in sufficient quantity to make its chemical isolation practicable. The difficulty, however, of such an enterprise would be not merely the sufficiently formidable one of quantity. H-substance, by common consent, is normally present inside the cells of the tissue. When we have attempted to extract it, we have invariably obtained histamine. If H-substance is not histamine, therefore, it is a substance which immediately yields it, when the simplest and least injurious procedures which we can devise are applied to its extraction from the cells, and its isolation for chemical study. We have no reason to expect that, when it had been liberated from the cells, H-substance would be more stable under such treatment; so that, even if chemically recognisable histamine were obtained from extra-cellular H-substance, the fact would add but little to our knowledge, and leave the question of identity almost as open as it is at present.

Accepting this lack of complete chemical evidence as, for the time being, inevitable, I think we should do well to beware of exaggerating its importance. Strictly speaking, we have as good chemical evidence of the presence of histamine in the cells of the body generally, and of its liberation from them under certain conditions, as we have of the existence of adrenaline in the suprarenal medulla, and of its secretion as such into the blood. All that we really know, in the latter case, is that adrenaline can be extracted from the gland, and isolated from the extract by suitable chemical procedures; and, further, that something, indistinguishable from adrenaline in action, is liberated into the blood leaving the gland when the splanchnic nerves are stimulated. Chemical evidence has not excluded, and is unlikely to exclude, the possibility that adrenaline may exist in the cell, and be secreted into the blood, not as free adrenaline, but as some more complex "A-substance." We assume, and I think rightly, that adrenaline is itself the physiological agent; and the real difficulty, in making the analogous assumption with regard to histamine, has arisen, not so much from the small gaps in the chemical evidence, as from the doubt as to whether histamine would fulfil all the physiological requirements.

Difficulties in the Identification.

One of the difficulties, which appears to have weighed with Lewis, is the relatively long persistence of some of the effects attributed to liberation of the H-substance; whereas we should expect that a substance so diffusible as histamine, as we know it in watery solutions of its pure salts, would be carried rapidly away in the blood stream. It is not easy to appraise the true significance of this apparent discrepancy. Direct evidence as to its meaning is not available; but there are not wanting indirect indications, such as the pronounced tendency of histamine to enter into loose combinations with colloidal substances, especially at certain reactions, which may well prove to have a bearing on the apparent behaviour of the H-substance. In circumstances altering the physiological condition of the cell-substance, histamine might be liberated, in one case free, in another loosely combined with products of large molecular weight and low diffusibility; on the other hand, changes in the neighbourhood of its liberation might greatly influence the tenacity of its adsorption by the tissues with which it comes into contact. It should be remembered, in this connexion, that the H-substance does not always give this appearance of low diffusibility, or close restriction of its action to the locality of its liberation. The subject of factitious urticaria owes his abnormality, according to Lewis, to the readiness with which the H-substance is liberated from the cells of his skin, in response to relatively mild mechanical stimulation. In such a subject Lewis found that the simultaneous production of wheals over a large area of skin was quickly followed by a distant dilator reaction of the small vessels of the blushing area on the face and neck, entirely comparable to that produced by introduction of a suitable, small dose of pure histamine into the general circulation. H. Kalk[16] has recently published observations to demonstrate that stimulation of the skin, in subjects of dermatographism, is followed by secretion of an acid gastric juice. This would indicate, not only that the H-substance may be quickly absorbed in significant amount from the site of its liberation, but that it shares yet another of the characteristic activities of histamine—namely, that on the gastric secretion.

While, therefore, some of the phenomena connected with the H-substance are not easy to reconcile immediately with the supposition that it is free histamine, there are others which would be equally difficult to explain, if it were supposed to be a much more complex and indiffusible body. If these difficulties alone were in question, it would seem rational, and entirely compatible with what we know of its properties, to suppose that histamine is the active constituent of the H-substance, and that the latter, according to the varying conditions of its liberation, may represent all grades of molecular association, from free histamine to relatively large and indiffusible complexes. The term "H-substance" would then no longer represent a hypothetical chemical entity, which might be histamine or something entirely different; it would represent a group of loose molecular combinations, of varying complexity, in which histamine may be liberated from cells during life, and to all of which it may impart its characteristic physiological actions.

I believe that such a conception would reconcile all the various facts yet available, concerning the natural tissue-reactions and the analogous effects of histamine, in man and the carnivora. I know of no other which would adequately account for the remarkable range of identities in action, and also for the minor apparent divergences in behaviour.

More serious difficulties arise, however, if we attempt to apply such a conception to all vertebrate animals. Laidlaw and I early pointed out that the rabbit, under ordinary conditions of experimental anæsthesia, failed to show the depressor, vasodilator response to small intravenous injections of histamine, which is so striking a feature of its effects on the cat, the dog, and the monkey; yet the rabbit does not lack the local vasodilator reaction to injury. Later evidence has weakened the significance of this contrast. Lewis observed that histamine would cause congestion and œdema of the rabbit's conjunctiva when locally applied, and Feldberg,[17] in my laboratory, demonstrated the general dilator response to histamine of the minute vessels of a rabbit under chloralose, and in the denervated ear of a rabbit without anæsthesia. There is not, accordingly, the sharp discrepancy which earlier evidence suggested, between the reactions of herbivorous and other mammals. It may be that the two effects of histamine described by Lewis—direct dilatation of minute vessels, and reflex dilatation of stronger arterioles—differ in relative prominence in different mammalian types. It should be noted that our chemical identifications of histamine in tissue extracts, needing large-scale work, have been carried out with organs from oxen and horses.

In the case of the frog, on the other hand, the lack of vasodilator action by histamine, which Laidlaw and I also first indicated, constitutes a genuine and complete discrepancy. Grant and Jones[18] have observed that the vessels of the frog's skin, and of the mucous membrane of its tongue, show local dilatation responses to injury or irritation, closely analogous to those seen in the skin of man. Histamine, on the other hand, whether locally applied or injected into the general circulation, produced no effects in the frog having any relation to these local dilator reactions, or in any way compatible with its participation in their production. Yet extracts from the frog's skin, similarly applied to the mucous membrane of its tongue, reproduced the vascular effects of mild injury as faithfully as human skin extract, or histamine, evokes the analogous response in human skin. Later they found that the wheal-producing extract from mammalian skin, when freed from excess of inorganic salts, was as inactive as histamine on the frog's mucous membrane. The frog-skin extract, on the other hand, contained a substance resembling histamine in its general chemical properties, and reproducing the various known actions of histamine on mammalian vessels and plain muscle, though with widely different relative intensities; it exhibited, in addition, the dilator action on frog's vessels, which histamine does not possess at all. The meaning of these results seems perfectly clear. So far from weakening the resemblance between the H-substance of *mammalian* skin and histamine, they add another and highly significant similarity, in the failure of both to dilate the vessels of the frog's tongue. The vasodilator principle of frog's skin, on the other hand, is clearly a different substance, though it appears to be a base akin to histamine in some of its chemical properties.

Viewed as a whole, the evidence seems to indicate histamine, in the mammals chiefly investigated, as a generally distributed constituent of the cells of the normal body, inert while it remains within the cell, but intensely active in producing local vasodilator reactions, when appropriate stimuli release it from the cell into the tissue fluid, either free or in molecular combinations of varying complexity. In other vertebrate types, such as the frog, some other basic substance, possibly allied to it, appears to replace histamine in distribution and function.

PROBLEMS OF THE PHYSIOLOGICAL SIGNIFICANCE OF HISTAMINE.

From such a conclusion a number of interesting physiological questions immediately arise. We may inquire, for example, whether the cells which are so exquisitely sensitive, to the presence of traces of histamine in the surrounding medium, themselves hold it inactive in their protoplasm; or whether, on the contrary, the cells from which it is released to produce its effects are of a different kind, and are themselves insensitive to its presence, in any relation to their walls. In the skin, which has been so much more completely studied in this connexion than other tissues, the evidence seems to be in favour of the latter alternative. Harris's experiments, in Lewis's laboratory, show that the histamine which can be extracted from skin is yielded chiefly, if not entirely, by the cells of the epidermis. There is no reason for supposing that the epidermal cells react to histamine in any way; so that the evidence is in favour of attributing the local vascular reactions of the skin to histamine liberated largely from cells which do not otherwise participate in the reaction. On the other hand, the endothelial and plain muscle cells, of the minute vessels concerned in the vascular reaction, form so small a part of the total mass of the skin tissue, that we cannot conclude from such evidence that they do not also contain histamine themselves. To glance for a moment at other effects of histamine than that on the minute blood-vessels, the activity which first brought it to my notice was its intense stimulation of the plain muscle of certain hollow viscera, particularly of the uterus and the bronchi. My colleagues and I have not chemically investigated plain muscle by itself, but some of Abel and Kubota's evidence suggests that it is relatively rich in histamine. If this is the case, its presence there indicates for histamine another type of physiological function; released by stimulus or injury from plain muscle, it will not only cause local vascular dilatation but play a part in exciting or maintaining the contractile reaction, either of the muscle cells directly injured, or of others in their immediate neighbourhood.

The fact that lung, the only tissue of those available for large-scale extraction which contains so high a proportion of endothelial cells, also contains by far the highest proportion of histamine among organs yet investigated, suggests, again, that endothelial cells must be rich in this base. It seems safe to conclude, however, that the histamine causing the evanescent vascular response to mild injury is largely a product of other cells in the neighbourhood of the reacting vessels.

The presence of histamine in so large quantity in the lung presents a physiological problem by itself. The facts that in the lungs alone there may be as much of this intensely active substance as of adrenaline in the suprarenal glands of the same animal, and that this organ, with its small intrinsic metabolism, has no obvious need for local variation of the diameter of its small vessels, naturally raises the question of an internal secretion of histamine from the lung, and its consequent function as a true hormone. There is no evidence of such a process, and it can only be recognised as a mere possibility. There is an alternative possibility, equally unsupported by any direct or adequate evidence, that the histamine, thus accumulated in the lung, may represent material which, having served its function elsewhere in more active tissues and escaped into the venous blood, has been caught on its way through the lung vessels, and held pending destruction by some method. Best's evidence of its disappearance in sterile, post-mortem autolysis would be compatible with such a possibility, but could hardly be regarded as significant evidence in its favour. The physiological significance of the histamine in the lung must still be regarded merely as a problem waiting for solution

Looking at all the evidence for the normal physiological functions of the histamine in various organs, I think that we may conclude that it is practically limited to actions in the immediate neighbourhood of its liberation. The very width of its distribution, in practically every organ and tissue investigated, might by itself be held to imply for it a function thus normally localised, as distinguished from a true hormone function through the blood stream. Such evidence as we have of this normal, local effect of histamine relates to its liberation by *stimuli injurious in their tendency, however mild in* degree. As to whether it is also liberated as a concomitant effect of normal metabolic activity we have no further evidence. On several previous occasions I have suggested that the liberation from the active cell of a substance acting like histamine on the minute vessels in its immediate neighbourhood should provide a perfect mechanism for the fine adjustment of the blood-flow to the fluctuating needs of small tissue units; but we have still no more than this teleological argument in favour of such a process. Taken by themselves, the facts yet available concerning the distribution of histamine in the body *give it no support; the passive lungs, with capillaries* widely open, are richest in histamine of all the organs yet examined, while the voluntary muscles, with their violent fluctuations of metabolism and of capillary patency, stand very low in the scale.

The few indications which we have of the action of histamine at a distance from the site of its liberation are not such as to suggest a hormone function in the true sense. I mentioned earlier its effect on the muscular coats of the hepatic veins, hitherto known and studied only in the dog. I think that we may reasonably suppose that histamine absorbed from the intestinal contents, through the branches of the portal vein, may bring this sluice-mechanism into play; but we could hardly class such an effect as a true hormone action. It is probable, in any case, that such a mechanism has more importance under pathological than under truly normal conditions. Similarly, the distant actions of histamine absorbed from urticarial wheals, as described by Lewis and by Kalk, should properly be classed not with the normal, physiological effects, but rather with the pathological phenomena, to which we must next turn our attention.

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COTTAGE HOSPITAL FOR NEWQUAY.—A committee which was appointed to consider the subject reported that a well-equipped cottage hospital had become "a live necessity" for Newquay and the seven neighbouring villages included in the scheme. The population of the district is 14,000, which is greatly increased by visitors in the summer months, yet there is no hospital accommodation nearer than Truro, 14 miles distant. It has therefore been decided to proceed immediately with the building of a hospital, with accommodation for 22 patients, of whom four or five will be private patients. There will be a small ward for children.

Reflections upon
THE NEED FOR A DEPARTMENT OF CLINICAL PHYSIOLOGY.

BY LINDSEY W. BATTEN, M.B. CAMB., M.R.C.P. LOND.,
ASSISTANT PHYSICIAN, EAST LONDON HOSPITAL, SHADWELL; LATE CHIEF ASSISTANT, DEPARTMENT OF DISEASES OF CHILDREN, ST. BARTHOLOMEW'S HOSPITAL.

THERE must surely arise before long, at least in every university and preferably in every medical school, a department of clinical physiology; and it is to be hoped that its coming is not far distant, for the need becomes almost daily more clear. The department will have two functions—research and teaching.

RESEARCH IN CLINICAL PHYSIOLOGY.

It may be that, hidden away in the pages of obscure monographs, a fair amount of ascertained fact, bearing on the morphology, X ray anatomy, biochemistry, and physiology of the normal man, woman, and child (as opposed to the laboratory animal and the sick human subject) exists. Dogmatic statements assuredly abound. But it is certain that well-founded information on the limits of the normal in any of these fields is hard to come by, and as far as practical medicine is concerned it is only too clear that the limits of the normal are not known, and that much of the accepted teaching about it is wholly inaccurate. This fact is repeatedly demonstrated somewhat as follows.

A patient, complaining of subjective symptoms of ill-health, not too well defined, consults a physician (using this term in the broadest possible sense). The latter, according to the era in which he lives, his medical training and the bent of his mind, discovers an abnormality, a retroflexed uterus, a sagging transverse colon, ren mobile, costa cervicalis, hypo- or hyper-chlorhydria, hypo- or hyper-arterial tension, "curvature of the spine" (this physician lived some time ago), an alteration in the protein particles, and refractive index of the serum (this one is alive to-day), undue mottling of the pulmonary fields and increased hilus shadows, too many streptococci in the stools, excessive alkalinity or acidity almost anywhere, a positive von Pirquet, a deviating nasal septum, an excessive cutaneous reaction to milk protein, or one of a hundred other such "abnormalities" old or new. At the time he discovers it, however, it is, of course, new, and he proceeds to treat it secundum artem. The patient is cured. She goes home and tells her friends. They come, with symptoms more or less similar, the same abnormality is discovered in several cases, they are treated—they, too, are cured. What further need have we of witnesses? The facts are published, the condition receives a name, a surprising number of hitherto obscure symptoms are found to be due to it, cures abound, and in the slack season the Press spreads the glad news. It is not until months have passed and some cases curiously resistant to treatment have begun to appear that another physician, more sceptically minded, takes a hundred medical students, including the hospital's Rugby football team, and discovers the abnormality in, say, 20 per cent. After some acrimonious correspondence in the technical press the matter fades into obscurity, but within a year the whole unedifying story repeats itself with a new "abnormality," and there is no sign that the field is exhausted. Biochemistry is still in its infancy, endocrinology is a young child, bacteriology barely adolescent, and practitioners of all kinds are almost as unwilling as ever they were to admit that faith may make their patients whole. The odd thing about the whole matter is that only in this indirect and spasmodic fashion is our knowledge of the normal and its *boundaries increased. It is nobody's business to be* exploring, surveying, and charting this imperfectly mapped territory.

It is abundantly clear that dissecting-room anatomy and laboratory physiology are, regarded as handmaids to medicine, unprofitable servants. Only by a continuous study "in the round" of normal men, women, and children, employing all the methods of clinical medicine, can the bounds of the normal be defined, these erratic excursions be forestalled or curtailed, and medicine be given that scientific basis, which it is so prone to boast of possessing already. To pursue such a study should be the first work of a department of clinical physiology; to check, constantly and repeatedly on an ever-widening scale the accepted standards employed in clinical medicine, to record its results and to see that its records are easily accessible to any seeker after truth. It will investigate the reactions of human beings to changes in diet and environment, to exercise and rest; it will endeavour to classify into types (and yet will be slow to do so dogmatically); it will measure, photograph, and skiagraph. It will watch for the appearance in wards and clinics of new clinical methods, signs, tests, and "instruments of precision," and especially for the postulation of abnormalities of form or function to explain familiar groups of symptoms. No less carefully will it observe the laboratory work of experimental physiologists, and it will promptly initiate control experiments on large groups of normal subjects to try out as far as may be the value of each new discovery, whether in laboratory or clinic.

And who will be its subjects? For routine anthropometric work it will employ the material nearest to its hand, medical students, probationer nurses "child welfare" infants, antenatal women; none of these will be the worse for being weighed and measured, in the broadest sense of those terms. For ad hoc control experiments it should not be difficult, even in this age of "safety first," to find sufficient volunteers.

As the department grows in strength and importance it will no doubt extend its range, and with tact and good management it will find it possible to examine recruits for industry and the services, candidates for life insurance, school-children, and a large number of the general public curious about the state of their health. Its statistical department will be kept busy. The work will be costly, but possibly some income by way of fees for work done may be obtainable, and both labour and money will be well spent in the service of truth.

Of the head of the department exceptional gifts and qualifications will be required. To a capacity for clear thinking and a single-minded devotion to truth he must add educational experience of an unusual kind. He must have something more than a good working knowledge of both laboratory physiology and clinical medicine with a basis of broad culture generally denied to those who abandon too early the study of the literæ humaniores for that of the physical sciences.

THE DEPARTMENT AS A TEACHING CENTRE.

Thus far the department has been considered only in relation to research, but the need for it as a teaching centre is no less, and the practical value of its work will be perhaps even greater. The gap between physiology and clinical medicine has been often mentioned. The saying that the first duty of the ward-clerk is to forget his physiology is quoted as a piece of deplorable advice, thank heaven long out of date; it is hinted that the gap is rapidly narrowing, and that quite soon medicine will be so nearly a pure science that there will be no gap at all. It is always assumed that medicine, not physiology, is to be responsible for the bridging operations. In actual fact the gap is still wide, the antiquated advice trembles on the lips of many a clinical teacher. Medicine is in no danger of becoming a science, but will remain an art for many a long day to come, and it is at least possible that, in so far as the gap can be bridged, physiology must be the responsible pontifex.

It has been rightly decreed that knowledge of the normal must precede investigation of the pathological, and for this reason, presumably, anatomy and physiology are studied early in the medical curriculum; yet the conscientious student, having pursued the study of these subjects even to the point demanded by the examiners for "the primary fellowship," and fairly crammed his memory with facts, figures, and mnemonics, arrives in the wards completely ignorant, in a clinical sense, of the normal which he will be endeavouring for the rest of his life to distinguish from the pathological. He has not even heard of such a thing as physical or physiological types, he has not inspected and percussed even one chest, much less has he compared the clinical aspect of a long thin chest with that of a short and broad one; he has not listened to one normal heart when he should be familiar with normal hearts beating quickly, normal hearts beating slowly, and normal hearts murmuring at their pulmonary bases, to say nothing of hearts occult from observation in deep and well-covered chests. He has never seen the normal fundus oculi, the larynx, or the drum of the ear, and he is completely ignorant of the clinical aspects of infancy, childhood, adolescence, and senescence. He can answer difficult questions on the latest theories of colour-vision, renal secretion, and protein metabolism; he can tell you within one decimal point per cent. the composition of human milk; he knows how much gliadin there is in bread; he can draw a map of the cerebral convolutions and another of the otic ganglion; he knows the origin, insertion, and nerve-supply of a hundred voluntary muscles and can say what each one would do if it contracted all alone. He probably knows more facts than he ever knew before or ever will again and they are facts concerning the structure and functioning of the human body; yet of men, women, and children regarded as living organisms, progressing from birth to death, eating, working, playing, and sleeping, of their bodily needs and requirements and of the variety of types to be found among them he knows scarcely more than his cousin apprenticed to industry or trade. Quite literally he does not even know the look of them. At the very point at which his studies seemed about to bear fruit they break off short and he is given to understand that he has now finished with the normal and may proceed to study the pathological.

He goes then to the wards, to the casualty and out-patient departments, and is there confronted by patients suffering from a wide variety of complaints and diseases. By a kind of trial-and-error method he does learn by degrees and in part to distinguish the normal from the abnormal, the normal being, for him, that dull and disappointing condition of affairs in which nothing pathological can be discovered. In patches, as for example in the children's department, he is taught a little about the healthy subject, but though at intervals he may be urged to study the normal, he feels, naturally enough, that this is not now his proper task. He has enough to do in studying disease, besides, has he not learned his anatomy and physiology?

It is not until after he is qualified that this deficiency in his knowledge and experience comes home to him, perhaps not even then. If, as happened to a part of one generation, he finds himself inspecting and examining recruits, soldiers, and pensioners in large numbers and for long periods, his eyes are opened perforce. If he goes on to examine normal children at welfare centres and schools his conception of the normal widens again and its true boundaries begin to appear. The extreme difficulty of defining them with certainty and the importance and fascination of this task also becomes apparent.

But for the majority who are seldom or never called upon to inspect healthy subjects the case is different and the results of this deficiency in the curriculum are not far to seek. First, it is within the knowledge of most that unusual physical or physiological types do far too often escape recognition and are confused with the clinical picture of some serious disease.

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tions and another of the otic gangli
origin, insertion, and nerve-suppl
voluntary muscles and can say wh
do if it contracted all alone. He
more facts than he ever knew befor
and they are facts concerning t
functioning of the human body; y
and children regarded as living orga
from birth to death, eating, wor
sleeping, of their bodily needs and
of the variety of types to be foun
knows scarcely more than his cous
industry or trade. Quite literally h
know the look of them. At the ve
his studies seemed about to bear fru
short and he is given to understand
finished with the normal and may
the pathological.

He goes then to the wards, to t
out-patient departments, and is the
patients suffering from a wide vari
and diseases. By a kind of trial-a
he does learn by degrees and in pa
the normal from the abnormal, the
him, that dull and disappointing co
in which nothing pathological can b
patches, as for example in the child
he is taught a little about the hea
though at intervals he may be ur
normal, he feels, naturally enough,
now his proper task. He has enough
disease, besides, has he not learned
physiology?

It is not until after he is qualified t
in his knowledge and experience co
perhaps not even then. If, as happ
one generation, he finds himself
examining recruits, soldiers, and pe
numbers and for long periods, his
perforce. If he goes on to examine
at welfare centres and schools his
normal widens again and its true h
to appear. The extreme difficulty
with certainty and the importance a
this task also becomes apparent.

But for the majority who are seldo
upon to inspect healthy subjects the
and the results of this deficiency i
are not far to seek. First, it is with
of most that unusual physical or ph
do far too often escape recognition
with the clinical picture of some

diet. The amount of extract used was that stated by the makers to be equivalent to 8 oz. of liver. In most of the later experiments the following preparation was given in one dose daily before the mid-day meal. This material was prepared as follows:—

Eight ounces of fresh calf's liver was scraped on a plate so that the hepatic parenchyma was separated from the connective tissue and reduced to a finely divided condition. To this was added the juices of two oranges and two lemons with one ounce of port wine and one ounce of sugar. The whole was pressed through a single thickness of gauze. Sufficient water was added to give 8 fluid ounces.

A like amount of this preparation if administered in three equal doses daily before meals was as efficacious as when given in one dose. In one series of experiments the raw liver was administered with the juices of two tomatoes.

All the blood used in tests of coagulability was obtained by venepuncture, 0·5 c.cm. of blood being employed in each experiment. Very small quantities of blood should not be used, as they give a false impression of the rapidity of the coagulation of hæmophilic blood in bulk. The clotting was observed in clean test-tubes at the temperatures recorded. Evaporation was prevented. The coagulation times given in Tables I. and II., as well as those shown in the graphs, were observed with blood obtained 12 hours after the ingestion of hepatic tissue. The more rapid effects of administration are recorded in Table III. The tables and graphs show the times required for the "completion of clotting"—that is to say, the formation of a complete gel. The expression "commencement of clotting" implies the first visible departure of the blood from fluidity. In the experiments with cooked brain 8 oz. was substituted for the meat at the mid-day meal.

Summary of Cases.

CASE 1.—Boy, aged 14 years, who had been previously admitted to hospital for epistaxis and hæmarthroses. For 29 days 8 oz. of cooked liver was substituted for the meat of the midday meal, but on several days part of the liver was not eaten, on some occasions only 2 oz. being taken. From the twenty-ninth till the fifty-first day 8 oz. of cooked liver and one ampoule of Burroughs Wellcome and Co.'s dry liver extract were given on alternate days. The effects on the speeds of blood clotting are given in Table I.

TABLE I.—*Showing the Increased Speeds of Blood Clotting following the Ingestion of Cooked Liver and Liver Extract.*

Number of days of treatment.	Diet.	Blood-clotting times (in minutes).	
		At 18°C.	At 37·5°C.
0 (before treatment)	Ordinary.	74	66
8	Cooked liver.	71	64
14		66	56
21		42	34
29	Cooked liver and extract on alternate days.	—	—
36		38	23
51		34	14

After the fifty-first day the boy refused to take any adequate quantities of cooked liver and a diet which included 8 oz. of cooked brains with and without the addition of 1 oz. of cooked liver was given for 34 days. During this period the clotting times of the blood at 37·5° C increased from 14 minutes to 29 minutes, and on the thirty-fourth day 60 minutes was required for coagulation at room temperature. The ordinary diet was then substituted for 18 days, and the clotting times at 37·5°C. increased from 29 minutes to 42 minutes and coagulation at room temperature required 73 minutes. The regression thus nearly reached the original condition. Eight ounces of raw calf's liver with the juices of two oranges and two lemons was then given daily in the form already described, in addition to the ordinary diet. The effects on the coagulability of the blood are shown in Table II.

TABLE II.—*Showing Clotting Times after the Ingestion of Raw Liver with the Juices of Oranges and Lemons.*

A = Number of days of treatment.
B = Clotting times at 37·5 C. in minutes.

A.	B.	A.	B.	A.	B.
0	42	12	12	32	7
4	15	15	8	33	6
7	6	18	8	37	7
9	6	25	10		

The coagulation time at 18° C. on the 37th day was 21 minutes.

For 34 days the same amount of raw liver with the juices of two tomatoes, one ounce of port wine, and one ounce of sugar was given in addition to the ordinary diet. Six days after the commencement of this treatment the coagulation time at 37·5° C. was 5 minutes, but it subsequently increased. On some occasions clotting commenced at 37·5° C. in 6 or 7 minutes, but the completion of clotting was considerably delayed, 16, 19, 20, 21 and 22 minutes being noted. On the thirty-fourth day clotting at 37·5° C. commenced in 7 minutes and was complete in 10 minutes.

On the clinical side Dr. Trevor Jones reports:—

"The patient (admitted to hospital Nov. 10th, 1928) before liver treatment was instituted had long-standing hæmarthroses in both knees and in the left elbow. In March, 1929, when the coagulation time had been reduced to 6 minutes several attempts were made to break down the adhesions under gas anæsthesia. No fresh effusions occurred during these attempts. There was some absorption of fluid in the knees and movements of the joints and massage of the adjacent muscles have not produced fresh effusions. But the improvement in the mobility of the joints has not been marked in this case."

CASES 2 AND 3 (boys aged 7 and 9 years respectively).—The effects of treatment on the speeds of blood clotting are shown in Graphs 1 and 2. In these diagrams ——— represents "ordinary diet," - - - - - represents a diet including 8 oz. of cooked liver, ... show a similar diet partly rejected, ——— designates a diet including 8 oz. of raw calf's liver with the juices of two oranges and two lemons, and -·-·-·-· indicates a diet including 8 oz. of raw calf's liver with the boiled juices of two oranges and two lemons.

On the clinical side Dr. Trevor Jones reports:—

"CASE 2 was admitted to hospital on Jan. 25th, 1929, and liver treatment was commenced on Feb. 6th, 1929, when the patient had a marked hæmarthrosis of the right knee. This cleared up in 4 to 5 weeks, and he was allowed to play games. A fall produced an intramuscular hæmorrhage 4 to 6 inches long in the back of the thigh which was absorbed in two weeks, during rest in bed. Several cuts and abrasions have occurred which stopped bleeding normally without treatment. On two occasions he pulled out a loose tooth and the bleeding was also within normal limits. A tendency to bruise more readily than normal persons remains."

"CASE 3.—Admitted to hospital Feb. 15th, 1929, when he had several subcutaneous hæmorrhages and a conjunctival hæmorrhage which cleared up in a fortnight after treatment. He is now allowed to play boisterous games with other boys, and there has been no recurrence of hæmorrhages since the treatment but a tendency to bruising persists. Small cuts and abrasions stop bleeding rapidly without requiring treatment."

The immediate effects of the ingestion of hepatic tissue on the coagulability of hæmophilic blood are illustrated in Table III.

TABLE III.—*Showing the Speeds of Clotting of Hæmophilic Bloods at 37·5°C. after the Ingestion of 8 oz. of Raw Calf's Liver, given with the Juices of Two Oranges and Two Lemons.*

Cases.	Clotting times after ingestion.			
	1 hour.	2 hours.	4·5 hours.	17 hours.
1	10 min.	6 min.	3 min.	10 min.
2	7 ,,	6 ,,	5 ,,	7 ,,
3	6 ,,	5 ,,	4·5 ,,	10 ,,

The Clotting of Shed Hæmophilic Blood by Thrombin.

Several years ago, Addis[14] stated that thrombin clots hæmophilic blood as rapidly as normal blood. Three years ago I tested the coagulant action of a thrombin (prepared at St. Mary's Hospital, London, and known as "protagulin") on the blood of Case 1, which then exhibited coagulation times of 48 minutes at 37·5° C. and 68 minutes at 18° C. The speeds of clotting were reduced by the addition of this hæmostatic to 9 minutes at 37·5° C. and 14 minutes at 18° C. The experiments were repeated with blood obtained by venepuncture from Cases 1, 2, and 3, when the clotting times at 37·5° C. had been reduced to less than 25 minutes by liver treatment. Two drops of a standard solution of protagulin were added to 2 c.cm. of blood in each experiment. In each case the whole of the blood firmly clotted at 37·5° C. in less than one and a half minutes and in two or three minutes at 18° C. Bleeding from small cuts was completely arrested in less than two minutes. It appears that this preparation of thrombin provides the means of arresting accessible hæmophilic bleeding when the speed of blood clotting at 37·5° C. is reduced below 25 minutes.

Ætiology.

The observations just recorded show that the daily ingestion of hepatic tissue increases the coagulability of hæmophilic blood and reduces the tendency to *spontaneous hæmorrhages.* The initial delay in the alteration of coagulability of hæmophilic blood when hepatic tissue is administered, the temporary regression during an early phase of the treatment in Case 2, and the effects produced by the discontinuance of liver diet suggest that a metabolic change is primarily involved, rather than direct action on the blood itself.

Although much attention has been given to the condition of the blood in hæmophilia, very few attempts have been made to trace the abnormality which leads to the production of blood which does not clot promptly when shed. More than a century ago, Nasse[25] suggested that in hæmophilia there is a defect in the growth of the blood and certain similarities in the condition of hæmophilic and embryonic bloods point in the same direction (Pickering and Gladstone[26]).

There are several indications that the liver produces bodies that are essential for blood clotting. Many facts point to the formation of fibrinogen in the liver, such as the loss of fibrinogen in the blood that follows hepatic injury or intoxication and that occurring after the establishment of an Eck's fistula or the occlusion of the hepatic blood-vessels (Foster and Whipple,[27] Doyon [28]), whilst the work of Nolf[29] indicates that prothrombin, which is also an essential factor in blood clotting, is likewise produced in the liver. There are also a considerable number of observations which suggest that products liberated by the lysis of erythrocytes are either the raw material of fibrinogen or stimulate the production of that body (Levi-Crailsheim,[30] Reymann,[31] Davide[32]). To this evidence is added the stimulation of erythropoiesis which, in certain conditions, follows the ingestion of liver, liver extract, and even the ash of hepatic tissues. It thus seems established that hepatic activity plays an important part in the production of blood.

Viewed in the light of these facts and inferences, the observations here recorded do not appear surprising. In hæmophilia it seems probable that the production of certain bodies which are essential for rapid blood clotting is either deranged or has not advanced beyond that found in an embryonic state. It also seems probable that material present in the liver of normal animals modifies the hepatic activity of hæmophilic persons and so leads to the production of blood which clots readily at body temperature.

My most cordial thanks are due to Dr. Basil Hood, the medical superintendent of St. Marylebone Hospital, for full facilities for work; to Dr. Trevor Jones for the clinical work and observations, also for much general help; and to Nurse S. Knowlton for rendering the preparation of raw liver palatable.

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PNEUMOCOCCAL SEPTICÆMIA DURING THE PUERPERIUM.

A CONTRIBUTION TO THE PROBLEM OF THE SPREAD OF PUERPERAL INFECTION.

BY JOAN NIXON, B.Sc., M.B. LOND.,
RESEARCH ASSISTANT, OBSTETRIC UNIT AND BACTERIOLOGY DEPARTMENT;
AND
HEDLEY D. WRIGHT, M.D., D.Sc. EDIN.,
READER IN BACTERIOLOGY, UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.

THE occurrence of primary uterine infection with the pneumococcus is perhaps sufficiently unusual to warrant the recording of the two cases described below, but there is the additional justification that in one of them the infection was traced back to a source which does not appear to have been sufficiently considered in relation to the general problem of puerperal sepsis—the respiratory tract of one of the attendants.

The details of the two cases were briefly as follows:

CASE 1.—A. B., aged 30. Fourth confinement. During pregnancy she had been debilitated and had had a cough. The labour, which was apparently one month premature, began on March 2nd, 1929. The patient was attended in her own home by her doctor, who states that the case was quite normal except for the fact that he ruptured the membranes. The placenta was delivered after 15 minutes and was intact. Next morning (March 3rd) there was abdominal pain and the same evening the child died, the cause of death being unknown. On March 4th (second day) the morning temperature was 101·8° F. and the pulse rapid. The lower part of the abdomen was tender. Urine had been passed and there was no vomiting. In the evening the temperature was lower, but the abdominal condition remained unchanged.

On March 5th (third day) she was admitted to hospital and was very ill. The temperature was 101° F., the pulse-rate 140 per minute, and the respiratory rate 40 per minute. The lower part of the abdomen was rigid and tender and did not move with respiration. The uterus was large and tender, and there was tenderness on palpation of the vaginal fornices. No mass could be felt in the pelvis. The lochia were red and were not offensive. There were no lacerations of the perineum. A few scattered rhonchi were heard in the chest, but there was no evidence of consolidation. Prof. F. J. Browne diagnosed peritonitis and operated immediately. A large amount of pus was found free in the peritoneal cavity. The uterus, ovaries, and Fallopian tubes were superficially inflamed, but there was no localised inflammation. The peritoneal cavity was drained and the wound closed. After the operation the patient grew steadily worse and died at 4 P.M. on March 6th (fourth day).

Bacteriological.—At the time of operation cultures were made from the vagina, the uterine cavity, the peritoneal exudate, and the blood. These all yielded growths of pneumococcus type I. The culture from the uterus on blood-agar was pure and heavy, that from the vagina much scantier. The colonies developing from the blood averaged 18 per c.cm. Just before death a small amount of sputum was inoculated into a mouse from which pneumococcus type I. was also isolated.

Post-mortem.—There was a great deal of pus in all parts of the abdominal cavity. The uterus was large and it and its appendages superficially inflamed. The endometrium was inflamed and slightly necrotic, but there was no part of the placenta retained. In the left broad ligament was a small area of suppuration. The pelvic and uterine vessels were not thrombosed. The other abdominal organs manifested the changes associated with septicæmia and peritonitis. The right pleural cavity contained a small amount of pus over the most dependent posterior part of the diaphragm, which on its inferior surface was very severely involved in the peritonitis. A very small part of the lung in immediate relation to the small collection of pus was congested and slightly consolidated.

It was clear that the primary infection was in the uterus and the lung changes were secondary. In sections of the uterus pneumococci were found in large numbers in the material covering the endometrium and in the inflamed broad ligament and the peritoneum.

Source of Infection.—As this infection originated in a private practice it was not possible to examine any of those who attended the case. Just before the patient's death the infecting organism was found in her mouth, but it must remain uncertain whether this means that she had harboured the organism before her delivery or that it was there in consequence of the slight lung lesion resulting from the septicæmia.

CASE 2.—C. D., aged 30. Primipara. One month postmature. Narrow pelvis. The patient went into labour on March 17th, 1929, and was attended in her own home as a "district" case. The labour was a prolonged one, and during the next 48 hours five vaginal examinations were made. After 60 hours (March 19th) the membranes ruptured, and three hours later forceps were unsuccessfully applied. One hour later a further unsuccessful application of forceps was made, after which the patient was removed to hospital, and with considerable difficulty the child was delivered with forceps. There was a second degree tear of the perineum and considerable laceration of the left labium majus. There was very little hæmorrhage, but severe shock. Next morning (March 20th) the temperature was up to 100° F., and the pulse-rate was 126 per minute; 50 c.cm. of antiscarlatinal serum were given. On the second day of the puerperium (March 21st) the temperature was 103° F. and the pulse-rate 140. There was abdominal distension and slight rigidity, but no tenderness except over the uterus. The legs were slightly œdematous. On March 22nd (third day) the condition remained much the same, but there was some vomiting. The lochia were not offensive. The perineal wound was very œdematous and was beginning to slough. Examination of the lungs and heart revealed no abnormality whatever.

On the fourth day (March 23rd) it was recognised that this was a pneumococcal infection and 100 c.cm. of type I. antipneumococcal serum were given intravenously, and repeated on two subsequent occasions. There were no untoward effects, but neither this nor the local treatment nor intravenous injections of metarsenobillon had any beneficial influence, and the patient died on March 24th (fifth day). The chest was repeatedly examined for signs of inflammation, but entirely without result.

Bacteriological.—Cultures from the vagina were made immediately after the patient's admission and before delivery. There had been some bleeding as a result of manipulations outside the hospital, so that the vaginal secretions were possibly considerably diluted. No pneumococci were obtained, but only a few staphylococci (*albus*) and diphtheroid bacilli. On March 21st (second day) cultures were made from the vagina and the blood—owing to the amount of perineal laceration a culture from the interior of the uterus could not be made. The vaginal culture yielded a heavy growth of pneumococcus type I. and a few colonies of *Bacillus coli*. The blood yielded two colonies per c.cm. of pneumococcus type I. On March 23rd (fourth day) cultures from the cervix and from the interior of the uterus grew diphtheroid bacilli and large numbers of pneumococci type I. On the same day a small amount of sputum and saliva was inoculated into a mouse, from which pneumococci (group IV.) were isolated, but *none of the type infecting the patient* (type I.)

An autopsy on this case was refused so that evidence as to the exact nature of the case is incomplete. But in view of the failure of special attempts made to find clinical evidence of a pulmonary lesion and particularly of the absence of the infecting organism from the saliva and sputum it seems quite evident that the infection was primarily a genital one and not in the respiratory tract.

Source of the Infection.—Altogether 11 individuals had had some association with the case, and the mouth and throat secretions of all of them were inoculated into mice to see if any of them were carriers of type I. pneumococci. Of the 11 who attended the patient at various times four had made vaginal examinations in the early stages and two of these had applied forceps unsuccessfully; one other had completed delivery of the child with forceps in hospital. The other six had not apparently had any close association with the case. Of these six one was a carrier of pneumococcus type III. and two others of pneumococcus group IV. (serologically heterogeneous group). Of the remaining five individuals two, who had only made vaginal examinations, had no pneumococci in their mouths; the third who had examined the patient several times was a carrier of group IV. pneumococci; the fourth, who had completed the delivery in hospital, was not a carrier, but the fifth who had made the second attempt at forceps delivery in the patient's home yielded a pneumococcus of type I. It was subsequently learned that he had been suffering during this period from a severe "cold." Fourteen days after the first examination no pneumococci could be found in his mouth secretions, so it appears that he was not a permanent carrier of the organism. It seems to us highly probable that the infection was transmitted from this individual to the patient, and it is worth noting that although masks are worn by those in attendance upon cases delivered in this hospital they are not used in cases on the district and were not used for this case.

There was no direct connexion between these two cases. The attendant who appears to have been implicated in the spread of the infection did assist at the operation on the first case and developed his "cold" three days later. It is just possible that he may have been infected at that time, but it seems much more probable that his infection was associated with the epidemic of respiratory disease which prevailed at the time.

Discussion.

Primary pneumococcal infection of the genital tract during the puerperium has been recorded in several papers published prior to 1912. These cases are reviewed by Bondy and they will not be further discussed here except to note that in some of them the bacteriological information is incomplete. Since that date cases have been recorded by Monckeberg, Seymour, and McCord. We have not been able to find any record of the type of pneumococcus occurring in such cases. In primary pneumococcal peritonitis occurring in children McCartney and Fraser found type I. pneumococci eight times and type II. twice.

In the recorded cases the source of the infection is not very often considered. Foulerton and Bonney state that two of their cases occurred in the practice of one doctor at about the same time, and Monckeberg reports that the midwife attending his case was suffering from tonsillitis and pneumococci were grown in large numbers from the lesion in her throat. He considers the midwife was the source of the infection, but there is no information as to the serological grouping of the organisms.

There is at present a healthy interest in the subject of puerperal infection coupled with a certain reasonable dissatisfaction with our recent lack of progress and a marked display of energy in an attempt to make good these deficiencies. There is at the same time some danger of misdirection of much of this energy on account of a lack of clarity in conception of the nature of this disease. It is too widely believed that all sepsis in the puerperium is due to the hæmolytic streptococcus. Recent work makes it quite evident (Bryce, Armstrong, and Burt-White) that much of the minor sepsis, probably what the older clinicians called sapræmia, is due to other organisms, and our own experience is exactly similar—of 22 cases which occurred in this hospital in 1928 only six were due to the *Streptococcus pyogenes.* The two cases herein described, while not in any way influencing the conclusions drawn from such statistics as those of Kinloch, Smith, and Stephen and much previous work that the severe cases are nearly always streptococcal, do still further emphasise the necessity of adequate bacteriological study of each case as a preliminary to the study of its origin. Our first case contributes nothing to the solution of the problem of the spread of infection, but in the second case we think there is no reasonable doubt that the organisms came from the upper respiratory tract of one of her attendants who was suffering from a mild infection of that area. It must be admitted that the infecting organism is an unusual one, but this was valuable because it admitted of such definite identification, and this is just what is so difficult with streptococci. But it seems highly probable that streptococcal infections may be transmitted in just the same way as has been suggested by Meleney and his associates for an epidemic in New York and by Kinloch and his associates in Aberdeen. Meleney seems to regard this type of infection as a simple transmission from a carrier, but the Aberdeen group discuss the subject as part of the much bigger problem of droplet infection in general. The New York workers have adopted as preventive measures the wearing of masks at all times when the patient is being examined or treated, and the exclusion from the staff of all proved carriers of hæmolytic streptococci. Kinloch and his associates deprecate the use of masks and stress the importance of minimising the risk of infection by increasing the amount of floor space per bed. We are inclined to think that this mode of spread is a special case of droplet infection in that the general infectivity of the community is important in so far as it increases the infectivity of the attendants. In our case it was not the carrier of a pneumococcus who transmitted the infection but the one individual who himself was suffering from an infection. McKinlay failed to find any direct statistical relationship between the incidence of streptococcal diseases in general and that of puerperal septicæmia. Our cases occurred during a period of epidemic respiratory disease at a time when pneumonia due to type I. pneumococcus was occurring with some frequency. Whether coincidentally or otherwise hæmolytic streptococci tend to increase in numbers in throats that are inflamed. Inflammation of the respiratory tract is such an obvious potential source of danger that it would seem incumbent on those dealing with midwifery cases who are suffering from such affections either to abstain temporarily or at any rate to take such precautions as will minimise the risk. The wearing of masks is at least worth consideration.

After the adoption of surgical aseptic methods in the practice of midwifery serious puerperal sepsis became much less common, but since this first preliminary decline occurred the incidence has remained at a fairly steady level. This may be a reflection of the efficiency of the aseptic technique of the obstetrician. On the other hand, it may be due to the neglect of precautions of a particular kind against some frequently present possibility of infection. We think that the respiratory tract is such a source, and that precautions against infection from this source should be carefully taken.

Future investigations will, we hope, yield us more exact knowledge of the relative importance of this and other factors in the establishment of puerperal [illegible]is.

[illegible] are [illegible]ebted to Prof. F. J. Browne for permission [illegible]se cases and for the opportunity of [illegible]em.

[illegible] at foot of next column.)

EXCRETION OF THE CONSTITUENT IONS OF SULPHUR WATER.*

BY DAVID BROWN, M.D., B.Sc. LOND.,
PHYSICIAN TO THE ROYAL BATH HOSPITAL, HARROGATE;
AND
ARNOLD WOODMANSEY, M.Sc.,
ANALYST TO THE HARROGATE CORPORATION.

BEFORE this work nothing was known about the elimination of the imbibed ions during a course of sulphur-water treatment by internal application. Even now it is impossible to say which channel—fæces, urine, or sweat—eliminates the actual constituents of the sulphur water when these are identical with those of normal excreta. Barium is the only constituent dealt with that is found in sulphur water and not in the body, and this, while presenting interesting features, is anomalous because it so readily forms insoluble compounds.

Conditions of Experiment.

Four experiments (denoted A, B, C, and D) were carried out on three subjects who, in their usual condition of health, were placed on fixed dietaries, suited to the appetite and inclination of each: (*a*) for four days (pre-sulphur period) to obtain the basal quantities of ions excreted before sulphur water was administered; (*b*) for four days (sulphur period), during which sulphur water was taken in place of an equal volume of plain drinking water; (*c*) for four days (post-sulphur period) when sulphur water was stopped and plain water resumed.

Fixed conditions of work, exercise, rest, and—as far as possible—sleep were observed. The fæces, urine, and sweat were quantitatively analysed for barium, manganese, calcium, magnesium, potassium, and sodium. In Experiment D sulphur as sulphate was also determined. In B and C chloride was estimated in the urine. In C the total urine nitrogen and basal metabolism were determined and the daily weight taken. Blood pressure was observed in B and C.

For details of the method of sweat collection (which we believe original) and for the full tabulated results reference must be made to the original paper in the Proceedings of the Royal Society of Medicine.

Results.

In C there was marked purgation, and the diuresis, observed in the earlier experiments on the same subject when living on a non-purin diet, was not observed. On the contrary, there was a lessened volume of urine—5630 c.cm. in the sulphur-water period, as against 6325 c.cm. for the pre-sulphur or basal line period. The average amount of solids, calculated from the specific gravity and compared with that of the basal line period, was increased by about 30 per cent. (31 g. as against 22·5 g.), falling to just below the basal line in the post-sulphur stage. This increase denotes increased metabolism.

In B, which was not associated with purgation, but rather with moderate constipation (there being no

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* Summary of a paper read before the Section of Balneology and Climatology of the Royal Society of Medicine on Jan. 10th, 1929.

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action of the bowel on one day), the diuresis was moderate, about 6 per cent., but the amount of solids in the urine was not markedly increased.

In *D*, where there was no considerable purgation, but from time to time looseness of bowels, there was an 8 per cent. increase in the volume of the urine in the sulphur period with an increase of 3 g. per diem in the excreted solids. In the post-sulphur period this diuresis continued with 10 per cent. reduction in the amount of solids passed. This result was thus intermediate between that where purgation was present and that where comparative constipation obtained.

Total nitrogen of the urine in C also showed an increase, as in the earlier experiments (on non-purin diet), but the short duration of the sulphur period probably did not allow this to develop to the amounts previously observed, so that it only rose 2¼ per cent. (instead of from 5 to 8 per cent.).

EXPERIMENT C.—*Total Nitrogen (Kjeldahl).*

Days		
1 to 4	Average daily excretion of N	16·1 g.
5 to 8	„ „	16·5 g.
9 to 12	„ „	16·1 g.

Average increase in daily excretion of N, 2¼ per cent.

The basal metabolism, taken by Dr. Geoffrey Holmes before the subject rose in the morning, showed no essential change. The blood pressure, taken by Dr. Wilfrid Edgecombe in B and C experiments, remained stationary (130 syst., 88 diastolic). Weight during Experiment C, the observations being made at the same hour of day and under same conditions, was as follows:—

Pre-sulphur period, loss	5¾ oz. daily.
Sulphur period, loss	8 oz. „
Post-sulphur period, loss	1¼ oz. „

The total loss was just under 4 lb. for the whole experiment.

Analysis of Results.

All the metallic ions taken in the ingested sulphur water were supposed to be eliminated during the sulphur water period, and were in each case deducted from the results of the sulphur water periods before the calculations were made of + or − excretion of the ions. This was done in order to apply the most unfavourable conditions in calculating the obtained results of plus excretion of ions.

Barium.—Never totally recovered. None in urine or sweat; blood (?). From the fæces 20 per cent. was recovered in Experiment A; 26 per cent. in B; 80 per cent. in C, and 61 per cent. in D.

Manganese.—Mainly in fæces and urine, and there was excess excretion in three cases out of four.

A— 30 per cent. retained
B— 20 „ excreted in excess.
C—300 „ „ „
D— 4 „ „ „

Calcium.

	(1)	(2)	(3)
A	16+	84+	50+
B	−51	− 1	−26
C	4+	−20	− 7
D	15+	27+	21+

Magnesium.

	(1)	(2)	(3)
A	−52	−19	−35
B	− 9	56+	23+
C	−32	− 6	−19
D	17+	70+	43+

Sodium.

	(1)	(2)	(3)
A	−31	13+	− 9
B	−71	28+	−23
C	−46	−30	−38
D	−14	13+	− 5

Potassium.

	(1)	(2)	(3)
A	12+	−21	− 5
B	−26	42+	8
C	84+	8+	46+
D	8+	−10	− 1

Sulphate.

	(1)	(2)	(3)
D	89+	17+	53+

There was general retention of Na ion during the sulphur period. The + excretion in three cases out of four during the sulphur period of Ca, K, and Mn ions suggests + metabolism of compounds containing these ions. The deficient excretion of the Mg ion is probably only due to the method of calculation, which supposes all ions of sulphur water to be excreted during the sulphur-water period. Possibly the + secretion of K ion is accompanied by replacement of this ion by the retained Na ion.

Thus, during the sulphur period: Managanese excretion, calcium excretion, and potassium excretion were increased in three experiments out of four, and magnesium excretion and sodium excretion were decreased in three experiments out of four, and four out of four respectively. During the post-sulphur period the percentage results were about equally divided between plus and minus, except that the retained sodium tended to be excreted and the excretion of magnesium was increased in two experiments out of four. The total percentage excretion in the sulphur and post-sulphur stages when taken together show nothing conclusive except a net retention of the sodium during the combined stages.

In Experiment D (the only one thus investigated) the percentage excretion of total sulphur was markedly increased, over and above that combined in the sulphur water—namely, 89 per cent. during the sulphur period and 17 per cent. during the post-sulphur period, an average excess of over 50 per cent. on the combined periods.

This sustained elimination of sulphur seems to us very noteworthy, considering the importance to life and health of sulphur-containing amino-acids (especially such an essential body as cystein and the recently discovered auto-oxidisable constituent of the cell-glutathione), as so far nothing has been known of the effects of sulphur water on the sulphur metabolism of the body. It will be noted that by all three avenues (bowel, kidney, and skin) the elimination of total sulphur was markedly increased. This result probably has a distinct clinical bearing. Dr. F. C. Eve, of Hull, has pointed out that in some cases of arthritis neutral sulphur of the urine is increased up to eight or ten times the normal amount. As is well recognised, neutral sulphur is that part of the sulphur of the urine which is least oxidised and probably comes direct from tissue breakdown.

Our results throw no light on the question of the ultimate origin of the increased sulphur output, but only point to increased breakdown of sulphur-containing substances either forming part of the food or coming from the tissues. Further experimentation on the relative quantities of total neutral, ethereal, and inorganic sulphur would appear a promising line of research if combined with accurate observation on the excretion of total nitrogen and urea.

The Possible Modes of Action of Sulphur Water.

1. The simplest theory is that it acts as a common drench, the effect being due to osmosis. This idea is negatived by the results and the problem is shown to be one of metabolic change.
2. Body ferments may be released by the removal (by oxidation) of the products of their own activity. In B (with constipation) the excretion of Ca, Mg, K, and Na is minus, whereas in C (with purgation) this excretion is plus.
3. Direct stimulation of the tissue ferments.
4. The retention of sodium has no doubt an important bearing. That Ca and K excretions are both increased shows the far-reaching effect on general metabolism.

Barium was only found in the fæces and to the average extent of only 50 per cent. The excretion of barium was largest during the sulphur period, and thereafter showed a rapid falling off. Hence we must conclude that a considerable but variable amount of barium is retained in the body tissues, probably in a nearly insoluble state, and perhaps fed gradually to the tissues.

We claim to have established that as the results of drinking sulphur water—

1. An increase of metabolism takes place.
2. The action of manganese in sulphur water probably provides the catalyst necessary for the stimulation of body ferments including possibly xanthine oxidase.
3. Barium of sulphur water has so far not been found in the general circulation; on the average 50 per cent. is retained. Whether this is slowly fed to the tissues, or is locked up in the intestinal mucosa, and thence gradually excreted, or whether it is lodged in the liver and then gradually fed to the tissues, is uncertain. In consonance with pharmacological experiments with pure preparations, the avenue of excretion, if any, seems to be the bowel.
4. There is distinct retention of sodium in the body with an increased extrusion of calcium and potassium. This agrees with results obtained by other experimenters using pure sodium preparations. There

must be a consequent modification of the crystalloid containing fluids of the cell.

5. The sulphur metabolism of the body is increased by 50 per cent. and this increase, by analogy with known effects of iron on free cystein and glutathione, may be due to the presence of manganese in sulphur water.

6. The chlorine ion is extruded from the body with greater ease than the sodium ion.

7. The percentage increases in excretion of chlorine were greatest by the bowel. The increased percentage excretion of sodium was greatest in the urine, except where there was great purgation.

8. The excretion by the skin of calcium, magnesium, sodium, and potassium was increased about 70 per cent. above the normal. This should be remembered in connexion with the skin disorders treated at our spas, and in relation to the use of preparations of calcium employed in the ordinary treatment of such cases.

9. During constipation the excretion of all ions (except sodium by urine and fæces) was decreased. Purgation increased the metabolism most.

The plus excretion of the ions in sulphur water was an entirely unexpected result, especially the plus excretion of manganese. The retention of barium in some position almost, if not entirely, outside the blood stream was also unanticipated. The retention of sodium in the general tissues was vaguely known, but, so far as we know, there were no definite figures proving its extent. The plus excretion of calcium and potassium might have been foretold from reading the literature on hypertonic injections of sodium chloride. The effects on excretion of the various ions by the skin appear to us to be very striking.

We place the possible methods by which sulphur water acts in the following order:—

(1) The more rapid removal of waste products when formed.

(2) The probable stimulation of the body ferments (possibly also of xanthine oxidase and sulphatase) by manganese, a constituent of sulphur water.

(3) An alteration in the cell fluids consequent on the absorption and retention of the sodium ion.

(4) Possible increase of permeability of the cell to sulphur-containing bodies.

(1) may be only a consequence of (2), (3), and (4).

We are unable at present to suggest a definite and satisfactory part for barium in the increased metabolism which follows ingestion of sulphur water in clinically suitable quantities.

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Clinical and Laboratory Notes.

A NOTE ON INTENSIVE IONISATION.

BY W. S. WHITCOMBE, M.D. BRUX., L.S.A. LOND.

IONISATION, ionto-phoresis or kataphoresis—whichever name is preferred—can be administered from the anode or from the kathode of a galvanic current.

With the kations I am not concerned. It is from the negative pole only that high doses (100–200 milliampères) can be given, and I have suggested the term "intensive ionisation" to designate this therapeutic measure which is capable of producing very remarkable results in the treatment of the various forms of chronic arthritis, neuritis, and fibrositis. The smaller doses (15–30 milliampères), which I understand are given at the various spas and electrotherapeutic institutions, are not sufficiently powerful to influence such diseases to any appreciable extent.

The output of ions from the applicator depends entirely upon the quantity of electricity (Coulombs) passing through the body; and the voltage must be strong enough to overcome the resistance of the body. The anions of the electrolyte are then carried by their electrical charge through the tissues towards the anode. What becomes of them? Physicists, like Sir Oliver Lodge, think that they are arrested on their way by the denser tissues, muscle, bone, and fibrous structures, and that their electrical charge then leaves them as deposits of nascent ions. That substances such as iodine, chlorine, and the salicylic radicle in the nascent state are very powerful germicides is beyond dispute; chlorine gas, the hypochlorites, and iodine are, of course, freely employed as antiseptics. If, then, by means of galvanism, we can drive their nascent ions into diseased areas, surely such a procedure is of the highest value?

At a demonstration which I gave at the Royal Society of Medicine on March 15th, I showed by a simple experiment the dissociation, by galvanism, of a solution of iodide of potash, whereby starch material at the anode was iodised to a deep blue colour after the passage of the current from the kathode, four inches distant. To prove the repulsion of the iodine from the electro-negative pad I enlisted the help of Mr. W. H. Martindale, Ph.D., who kindly analysed the electrolyte solution of potassium iodide on two occasions before and after treatment. His analysis showed that about 2½ grains of pot. iod. were lost by a pad of 63 square inches surface soaked in the electrolyte solution. A physicist can easily calculate the number of million nascent ions of iodine, representing one grain of potassium iodide, discharged from the kathode; one atom of iodine being estimated at 53 electrons.

Considering the proximity of the body fluids (lymph and blood) to the epidermis, how is it possible to doubt the passage of these nascent ions into the tissues? I believe that they, in some part, enter into albuminous combinations with the sera of these fluids. How else can we account for the copper penny taste in the mouth and the iodine in the urine?

My immediate object is to give a detailed account of the process by which these high doses can be given safely and comfortably. This technique I demonstrated on a patient suffering from hip pain, at the Royal Society of Medicine. On that occasion a current of 145 milliampères at 80 volts was passed, for 25 minutes, from hip to hip, a distance of 17 inches. It was noticeable to all those present that, at the end of the treatment the skin showed merely a uniform blush, there was no sign of burning or blistering, and there was no discomfort. My technique is as follows:—

Pads composed of three layers of gamgee tissue, lightly quilted in a covering of lint, are made to the size and shape required. They are backed by a conductor material for which I suggest the term "galvani." This gauze is made of fine gold-plated copper ribbon wound round thread woven to a ¼ inch square mesh. At my request it is now stocked by Messrs. Schall and Son and by Messrs. Allen and Hanburys, so that it is easily obtainable. Safety-pin terminals connect up the current through rubber-covered cables.

There are eminent authorities on electrotherapeutics who do not admit the specific action of these nascent elements, and suggest that the effect of the treatment is due to metabolic changes in the tissues consequent on the galvanic current. They may be right, but what evidence exists to support this theory? There is a great deal of evidence on the other side. It is probable that we shall have to enlist the help of the bacteriologists to settle the matter, for if they can show that pathogenic organisms are destroyed by the ionisation of antiseptic chemicals such as iodine, and are not sensibly affected by the galvanic current alone, then the case is proved; also the biochemists might help us very considerably by examining the body fluids.

GENERAL ANÆSTHESIA BY THE INTRAVENOUS INJECTION OF ETHYL ALCOHOL.

By Julien D. Constantin, M.R.C.S. Eng.,
ANÆSTHETIST TO THE MILLER GENERAL HOSPITAL, GREENWICH, AND THE FRENCH HOSPITAL, SHAFTESBURY AVENUE.

In view of the premature and mostly inaccurate publicity given to the method of anæsthesia advocated by Dr. Miguel Garcia Marin, of the Military Hospital, Mexico City, it seems desirable to describe the method in detail.

Intravenous anæsthesia is not a new thing, but the use of ethyl alcohol intravenously had not, as far as I know, been reported until Dr. Marin's experiments became known.[1] The method consists in the administration, intravenously, of 90 per cent. pure ethyl alcohol in a solution of glucose. Dr. Marin has been experimenting for over four years, during which time he performed about 700 operations on animals before applying his technique to operations on human beings. Some 300 patients have now been anæsthetised successfully in this way for various operations.

Dr. Marin gives as his reason for using ethyl alcohol that it "dissolves lipoids and penetrates by endosmosis the protoplasm of the nerve cells, hindering their metabolism."

He claims that the adoption of the intravenous route does away with any risk of initial syncope through direct irritation of the mucous membrane. Further advantages of intravenous anæsthesia are: (a) No mask, or other appliances to the face or mouth, need be used during any operation to the head or face, which eliminates the possibility of infection from this source and also leaves a clearer field of action to the operator. (b) There is less danger of post-anæsthetic pneumonic complications. (c) The risks of fire during the use of thermocautery or diathermy are done away with. (d) The possibility of injury to the eyes from accidental contact with an irritating anæsthetic is avoided. (e) Perfect control of administration obtained (see below). (f) No material effect is noticeable on the blood pressure. There is an initial rise, but this is of short duration, and the blood pressure soon falls to normal again and remains normal.

It is claimed that, since ethyl alcohol is 137 times less toxic than chloroform, and since surgical anæsthesia can be obtained with a dose three to four times smaller than the lethal one, there must be a large margin of safety.

Technique.

The usual aseptic and antiseptic precautions, as for any other intravenous administration, should be taken. An ingenious apparatus has been devised by Dr. Rooul Ortiz, of Mexico, a collaborator of Dr. Marin, but a convenient, if not ideal, substitute may be found in the old Army 606 outfit, interposing a two-way stop-cock at the junction of the two outlet tubes.

Two sterile solutions are used, one in each container. They are: (a) an isotonic solution of glucose, and (b) a solution of pure ethyl alcohol and glucose—viz., 30 c.cm. of 96 per cent. ethyl alcohol in 70 c.cm. of a 25 per cent. solution of glucose. Any vein may be selected to suit the convenience of the anæsthetist or the surgeon. Once the needle is ascertained to be well inside the lumen of the vein, solution (a) is allowed to flow and a few cubic centimetres are injected; then the two-way tap is turned over to allow solution (b) to flow at a rate of not more than 10 c.cm. in 30 seconds. This rate is more or less maintained until anæsthesia has been induced. When anæsthesia is considered sufficiently deep, the tap can be turned off; or at the discretion of the anæsthetist more anæsthetic or isotonic solution can be given. The needle may be held in position during the administration by pieces or sticking plaster. The dosage is estimated from the body-weight of the patient (2 to 3 c.cm. of the 96 per cent. pure alcohol per kg. of weight), but one is seldom called upon to make use of the maximum allowance.

Results.

Induction may take from 2 to 15 minutes. There is no initial stage of excitement such as may occur with inhalation anæsthesia. Perfect relaxation is said to be a chief feature, the breathing being very quiet; and naturally this is of great assistance to the surgeon in all abdominal cases. The method should not be employed for infants or in cases of advanced pulmonary tuberculosis, but the 300 cases already operated on have included patients with definite cardiac lesions and also diabetics. Bright's disease is said not to be a contra-indication. One curious contention is made—namely, that alcoholics require a dose even smaller than the average temperate subject.

Surgical anæsthesia is reckoned to last an hour and a half, but may be prolonged, by giving more anæsthetic, up to four hours. The recovery is peaceful and there are no ill-effects, such as vomiting. The patient may even be fed if the nature of the operation so permits. There is a period of post-anæsthetic analgesia that may last three to four hours or more. During the experimental stage there were instances of hæmoglobinuria, but this trouble was soon eliminated when isotonic solutions of glucose were employed and the correct dilution of alcohol was adopted, thereby ensuring proper diuresis.

My acquaintance with this type of anæsthesia is so far limited to two cases, but I was greatly impressed by the results obtained.

The first case was that of a woman, aged 58, with a slight cardiac arrhythmia, who walked into the hospital a few moments before the operation for onychogryphosis, and, therefore, had had none of the preparation one would expect before an anæsthetic. Her weight was a little over 9 st. and it was reckoned that her allowance would be about 150 c.cm. of 96 per cent. ethyl alcohol. The induction took 13 minutes and was very peaceful, the anæsthesia being gradual and uneventful. The corneal reflex was slow in disappearing. Although the surgical part of the operation was relatively a small one, I had the opportunity of testing the relaxation of the abdominal walls by pressure, and everything seemed apparently as it should be, though I should hesitate to say whether the patient would have reacted to incision of the parietal peritoneum at that stage. The systolic blood pressure, taken just before the anæsthetic, was 130, and when anæsthesia had been induced it was still the same. The patient, seen two hours after the anæsthesia, although conscious to a certain degree, was somewhat inclined to be "fidgety" with her arms and incoherent in her speech; otherwise she seemed to be quite comfortable. She suffered from incontinence of urine once, three hours after the operation.

The second case was that of a man of between 50 and 60 years of age, who had an excision of an epithelioma of the upper lip with the diathermy "knife." The same solution as in the first case was again employed, and the total quantity of alcohol administered was 175 c.cm. The time of induction here was also 13 minutes, and again there was no excitement, the man being inclined to be talkative and apparently experiencing no distress or discomfort. In my opinion the operation was painlessly performed, and except for a few twitchings of the facial muscles, due to direct electrical stimulation, there was no movement of the body. The patient was conscious almost immediately after the operation, and an hour and a half afterwards he was sitting up in bed taking nourishment. He had not vomited, and he said he did not feel any nausea; he talked sensibly, but seemed to be somewhat "merry and bright," as after a mild potation.

I observed that in these two cases the respiration had a tendency to be perhaps too shallow, but there was immediately a distinct improvement whenever the tap was switched over to the isotonic glucose solution only. I point this out to show that great control is available during administration.

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[1] Thesis presented to the National University of Mexico, 1929.

NOTE ON
INTRAVENOUS ANTITOXIN IN AN OUTBREAK OF SCARLET FEVER IN A PUBLIC SCHOOL.

By H. Stanley Banks, M.D. Glasg., D.P.H. Camb.,
MEDICAL SUPERINTENDENT, ISOLATION HOSPITAL AND SANATORIUM, LEICESTER.

Scarlet fever of a severe semi-septic type broke out among the boys of a public school in Leicestershire in February, 1929. The first nine cases were treated by ordinary expectant methods and without antitoxin. The course of the disease in these gave rise to much anxiety, and complications were frequent, as noted in the Table below.

Then occurred the worst case of all, a boy aged 13, who, when seen by me about the seventh day of the disease, had already a severely ulcerated throat, cervical glands enlarged and tender, double acute suppurative otitis media, and acute mastoid suppuration on one side. He was given 10 c.cm. scarlatinal antitoxin intravenously, unfortunately without effect at this stage. The sepsis developed into pyæmia with multiple purulent arthritis, involving incisions into the hip-joint, the elbow-joint, both ankle-joints, and the double mastoid operation. The serum was given too late in this case and the dose was too low for such a severe case.

The subsequent cases, 16 in number, were treated early in the acute stage with antitoxin *intravenously* according to the technique which I have previously described[1]. In these 16 cases the acute stage, though apparently of the same sharp type as the others, was arrested within 12–24 hours of the injection; further, no desquamation occurred and the complications were limited to one mild adenitis in a case who received his antitoxin on the fourth day of his disease, and one simple hordeolum. All 16 cases were allowed up within a week, and were discharged from isolation in about a fortnight's time.

All were boys between the ages of 12 and 18 years, except one master aged 49 years. All received their injections within the first four days of their disease, generally on the second or third day. There were no ill-effects noted from the serum administration, although one boy had a moderately severe rigor and two had hyperpyrexia for a few hours after the injection. In one case intravenous serum appeared to be contra-indicated owing to a history of hay-fever. In this case an intradermal test injection of 1 in 10 dilution of the serum was done and it did not produce any reaction. Accordingly, the usual dose, 10 c.cm. of serum was injected intravenously, and no ill-effect was noted.

The following Table gives particulars of the complications noted in this interesting series :—

Scarlet Fever Complications.

Nine cases not treated with antitoxin.

Suppurative otitis media with persistent otorrhœa	2	Dacryo-cystitis	1
Non-suppurative otitis media	2	Pneumonia	1
Albuminuria or nephritis about third week ..	7	Jaundice	1
Empyema of maxillary antrum and frontal sinus	1	Adenitis	7
		Nasal discharge	6
		Desquamation	9

Sixteen cases treated with intravenous antitoxin.

Adenitis	1	Hordeolum	1

The only case omitted from the Table is the severe case of pyæmia noted above, in which the serum was given too late to be effective.

The injections, with the exception of the first two, were given by Dr. Hubert L. Ellison, to whom I am indebted for detailed information as to the course of the outbreak.

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[1] Banks, H. S., and Mackenzie, J. C. H.: The Lancet, Feb. 23rd, p. 381.

Medical Societies.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.

At a meeting of this Society, held at the rooms of the Medical Society of London, on May 31st, Dr. F. J. H. Coutts, the President, being in the chair, Colonel L. W. Harrison reviewed some of the

Experimental Work in Syphilis,

particularly that bearing on resistance to infection and reinfection. Referring to the well-known difficulty or impossibility of reinfecting a syphilitic soon after outbreak of the primary sore and to the long periods of latency after subsidence of early symptoms, he discussed the theory of Neisser, which is held also by Kolle and his school, that these phenomena are due not to immunity in the sense of active resistance but to "anergie," or mere tolerance of *Spirochæta pallida* by the tissues. Kolle and Schlossberger demonstrated complete natural "anergie" in mice, the spirochæte spreading through the tissues of these animals after inoculation and remaining there in a virulent state for many months without evoking any signs of disease. Numerous experiments have demonstrated a natural, partial "anergie" in rabbits, a proportion of which develop no chancre after primary inoculation but the spirochætes spread through their tissues, as proved by infectivity of the lymph glands and possibly the development of generalised lesions. Experiments show that "anergie" qua the development of a primary sore can be brought about in rabbits and human beings by treatment during the incubation stage which is insufficient to destroy the infection. Brown and Pearce and Kolle have suggested on the strength of animal experiments that in human beings, in certain circumstances of primary infection, no chancre may develop. Although the non-development of a chancre is common enough, no evidence has been produced which proves that mice, rabbits, or human beings can resist primary invasion.

Development of Immunity.

Colonel Harrison went on to discuss the development of immunity in an animal which has been infected for some time, and reviewed experiments by numerous workers to show that in the serum of man or an infected animal there has been demonstrated little evidence of antibodies to virulent spirochætes, though the serum of infected animals or of normal animals which have been treated with vaccines of *S. pallida* may act against cultural spirochætes. Sachs, Klopstock, and Weil found that, after inoculation with alcoholic extract of heart plus a foreign (pig's) serum, a rabbit becomes positive to Wassermann and flocculation tests, showing that these tests depend on antibody to lipoid. The views of F. Klopstock that the antigen is spirochætal lipoid and those of Torii that it is tissue lipoid were discussed, the evidence seeming to favour the views of Torii. Bergel has presented histological evidence that mononuclear cells, by virtue of lipolytic enzymes, break up the spirochæte into granules, but Bergel's views have not been supported greatly by other workers.

On the indirect evidence of acquired immunity, Kolle showed that in rabbits after the outbreak of the primary sore it becomes increasingly difficult to provoke by reinoculation a second primary sore until after the ninetieth day the reinoculation hardly ever succeeds. These experiments have been substantially confirmed by Chesney and Kemp, Uhlenhuth and Grossmann and others, but these workers do not support the inference of Kolle that failure to reinfect depends on the continued presence of the original spirochætes. They have produced evidence that rabbits can be cured by injections of arsenobenzol, as proved by non-infectivity of their glands, and yet, provided the original infection has lasted long enough, reinoculation provokes no chancre. Further, as showing that infection stimulated the *development of properties actively antagonistic to S. pallida*, in a certain proportion of the animals which present no chancre after reinoculation there is no spread of the virus to the tissues; thus in these animals there has developed in the course of the primary infection not merely "anergic" or "chancre immunity" but active immunity.

Resistance to Infection and Reinfection.

The immunity of rabbits resulting from infection may not apply to virus from another source; thus a rabbit originally infected with the Truffi strain of *S. pallida* may resist infection with the homologous strain but be reinfected by the Nichols strain and vice versa. This specificity of immunity does not occur in man, and some evidence has been produced, notably by Jahnel and Lange, that a syphilitic can resist infection with *S. pertenuis* of yaws. That immunity depends on interaction of the spirochæte and the tissues seems to be demonstrated by the experiments of Manteufel and Richter and others, which show that a rabbit inoculated intravenously *may develop no lesions and can then be superinfected* by intratesticular inoculation. Also Brown and Pearce showed that the more the development of the primary lesion was interfered with by treatment short of that required to destroy the infection and the fewer the number of primary lesions, the greater the certainty that generalised lesions would *develop. The fact that a number of animals whose* infections had lasted 90 or more days were left after sterilisation with only a chancre immunity has suggested to Chesney and Kemp the possibility that, in men who after apparently successful treatment have remained negative for many months and have then become serologically positive, the cause may lie not in relapse of the original infection but in reinfection without chancre. The effect of injury in breaking down "anergic" in rabbits qua development of lesions was demonstrated by Chesney and Kemp. In rabbits which had been treated late and then reinoculated with syphilitic virus into wounds in the back chancres followed in 50 per cent. of cases, which contrasts with the rarity of chancres following intratesticular reinoculation of rabbits treated late in the disease. Also, Chesney, Turner and Halley showed that, if rabbits with granulating wounds, or new scars of such, are inoculated intravenously, a route which does not commonly result in lesions, syphilomata developed in the granulating wounds, or in the scars, within periods closely approximating the average for incubation. Chesney, Turner and Halley related two human cases which demonstrated very clearly the tendency of syphilomata to develop in the sites of wounds or injuries. The slow development of chancre immunity in men has been demonstrated by Halley and Wassermann. These workers studied *the literature on 676 cases of reinfection, and, after* rejecting 447 as inadmissible, found in the remainder that 97·8 per cent. were treated first in the primary and secondary stages and that in practically all the first infection when first treated was less than 16 weeks old, while in 82 per cent. it was less than 8 weeks old. This suggests that when treatment is commenced soon after the sixteenth week a chancreless infection may follow reinoculation. Brown and Pearce have shown evidence that resistance to *S. pallida* is bound up with the activity of the endocrine system and the lymphoid tissues. They have also shown that animals exposed to light present a more effective response to infection than do those kept in the dark. Thus they show that the cure of syphilis is not merely a matter of a test-tube reaction between remedy and spirochæte.

Schamberg and Rule have shown, Colonel HARRISON continued, that in rabbits the artificial production of high temperatures by hot baths can prevent the development of syphilis after inoculation. Also, like Weichbrodt, who raised the animals' temperatures by putting them in an incubator, that artificially produced high temperatures favour the retrogression of syphilitic lesions. Experiments on syphilitic *men carried out by Schamberg and Tseng, who found* that the body temperature could safely be raised to 106° F., were not very conclusive.

Levaditi and colleagues have shown that bismuth and vanadium are prophylactically and therapeutically effective only so long as the amount of metal absorbed and incorporated in the tissues ("metallic *potential") is above a certain level and that this* level is more easily attained with the basic tartrate of bismuth (trépol) than with metallic bismuth in fine subdivision (neo-trépol). Thus trépol protected a rabbit against inoculation up to 152 days later while neo-trépol protected only two out of nine rabbits inoculated 73 days after the injection.

Discussion.

Dr. **DAVID LEES** agreed as to the value and significance of the patient's constitution in the results of treatment; but would like more details, and as to what were the best means of reinforcing a patient's resistance when it was low. Mono- and poly-glandular therapy had not given him assistance in this. He also remarked on the paucity of the experimental work done in this country on syphilis in comparison with that in other lands.

Dr. **H. M. HANSCHELL** supported the idea that the llama was very susceptible to syphilitic infection; in Peru it was not infrequent for drovers to attribute their syphilis to that animal. Some patients who *showed a poor response to antisyphilitic* measures reacted well as soon as a course of cod-liver oil was given. He was able to confirm several points in the paper from his own experience.

Dr. **H. C. SEMON** expressed scepticism on the conclusions which were drawn as to suprainfection in animals which had been treated, in that this *treatment had set up bismuth depôts, which at a* later stage might protect against further infections. The choice of the site of previous injury for the manifestation of syphilitic disease had a parallel in the case of psoriasis, which was often found on tattoo marks.

Discussion is to be resumed at the next meeting.

ROYAL SOCIETY OF MEDICINE.

SECTION OF LARYNGOLOGY.

RADIUM TREATMENT OF MALIGNANT DISEASE OF THE ŒSOPHAGUS.

THE summer meeting of this Section was held on June 7th, Mr. H. **BELL TAWSE** presiding.

Thoracotomy and Radon Needles.

Mr. **F. J. CLEMINSON** read a paper on Thoracotomy in the Treatment of Malignant Disease of the *Œsophagus by Radon. The mortality of œsophageal* cancer at the present time, he said, was almost 100 per cent. Attempts to remove the growth by operation nearly always resulted in the patient's death. The use of radium under œsophagoscopy had not more than an occasional cure to its credit. The results could thus hardly be worse and there was always a chance that a new technique might improve them. He had, therefore, attempted to treat cases by inducing collapse of the lung on one side, and then opening the thorax with a view to placing radon needles in the periphery of the growth. Radon was used to obviate the need of removing the source of irradiation after the exposure had been completed. After the patient had recovered somewhat from the operation the other side of the chest could be opened and the procedure repeated. He had treated three cases in this way.

The first patient was a nervous man aged 74, first seen in June, 1928. For three months he had had indigestion, with difficulty in swallowing, and had lost 7 lb. in weight. A skiagram showed an irregular stricture from the fourth to the sixth dorsal vertebræ. The appearance was regarded as strongly suggestive of malignant disease. Œsophagoscopy showed a growth in the upper margin of the œsophagus, 9½ in. from the incisor teeth. A small portion removed showed actively growing carcinoma, many of the cells undergoing active mitosis. Removal of the eighth rib gave a good view of the region. It was not possible to feel the growth, but 20 unscreened radon seeds, each containing 1·2 millicuries, were implanted by means of a curved needle and trocar, being distributed along the growth. The pleural cavity was mopped out with 1 in 1000 flavine, and the chest wall sutured without drainage. Seven to ten days after operation there was distinct improvement in swallowing, but convalescence was delayed by the formation of pleural effusion, possibly attributable to the fact that the radon seeds had not been screened. Fifty millicuries were then passed down the œsophagus in a platinum tube and left for 24 hours. Some weeks later the patient was found to have lost ground and was bringing up much sputum, but he could swallow such solid food as bacon and eggs. Eighteen weeks after the performance of the thoracotomy the man died, the symptoms indicating a tracheal-œsophageal fistula; an autopsy was not allowed.

The second patient treated had complained of the return of food five minutes after it was swallowed; when first seen he could take only fluids. X rays showed an irregular stricture at and below the level of the arch of the aorta. Malignant disease was diagnosed from a specimen removed. The technique of the operation performed was similar to that described above, except that the radon seeds were screened. On the fifth day the temperature was 101° F., and there was a moderate pleural effusion. Under medical treatment the temperature became normal and the effusion had cleared up by the twelfth day. Noticeable improvement in swallowing followed, but only for a few weeks; after six weeks a radiogram showed obstruction below the level of the aortic arch. The treatment was repeated, but death occurred four months after the thoracotomy. The autopsy showed carcinoma on the left side of the œsophagus, extending for 1½ in. Below the aorta was an opening into the mediastinal tissue which led to a peri-œsophageal abscess. The extent of the growth was 4 in. The abscess had allowed the radon seeds to escape.

The third patient was a man, aged 61, who had had dysphagia for five months. His stricture was at the level of the fourth dorsal vertebra. The left vocal cord was paralysed. The growth was a squamous-celled carcinoma. The case was dealt with on the same lines as the others, but he died five weeks after the thorax had been opened. Here also an opening in the gullet led into an abscess cavity. The growth was so extensive that it was not really a suitable case for radium therapy.

Mr. MUSGRAVE WOODMAN (Birmingham) also gave a communication on the Insertion and Use of Radon in Cancer of the Œsophagus. He said that the use of central large doses of radium had failed, because the radium was in contact with the central mass of necrotic tissue, and far from the growing edge of the tumour. Moreover, the presence of a mechanical appliance, such as a tube, led to the formation of a fibrous stricture. He favoured the use of radon needles, platinum-screened, which need not be removed. His cases had all been examined by X rays each month. In none of the cases had a needle passed into the mediastinum, nor had there been inflammatory reaction round them. None of the patients had shown a general reaction, nor had there been any immediate mortality. There was general improvement in swallowing afterwards. One patient, however, died of tracheal fistula three weeks after the insertion of the radon, and the post-mortem examination revealed two burns, both ulcerated, and one having perforated. He attributed the burns to an excessive concentration of radon. Three sections from a fatal case had been examined pathologically. The first, taken from a spot remote from the radon seeds, showed typical active epithelioma, the second, from a site fairly close to a radon seed, was more indolent and less malignant; while the third, quite close to a radon seed, showed definite regression and more evidence of fibrous tissue. He feared few patients would be found suitable for this treatment, since it was difficult to detect œsophageal cancer in an early stage, but he was hopeful that ultimately these growths would be brought under control.

Radon and Diathermy.

Mr. W. S. THACKER NEVILLE read a paper on Two Cases of Œsophageal Carcinoma Treated by Radon and Diathermy. He said that the treatment of carcinoma in this region when the cost of radium was prohibitive was a difficulty. In one patient he inserted a Souttar's tube, but it became blocked, and death occurred a few months later. In one case diathermy rendered a gastrostomy unnecessary, but it did not prevent secondary growths. This man lived for a year, and was able to swallow and to carry on his work as a blacksmith for eight months. Another patient had radon inserted into the growth, and lived for five months afterwards.

Dr. BROWN KELLY thought that at the present stage these measures could be looked upon only as palliative. The food given to patients should be soft and semi-liquid. He believed that in the future intubation would be used mainly for a persistent application of radium; he had found it unsatisfactory when the disease was at the ends of the gullet.

Mr. W. HOWARTH did not think the outlook in regard to the treatment of cancer of the œsophagus by radium was more hopeful now than when he began to study the subject in 1912, though access through the chest made its application more convenient. He had not tried radon. The main essential in the irradiation treatment of malignant disease was that every cancer cell should receive a lethal dose. This could only be achieved, he thought, by a combination of the external with the internal methods. Thoracotomy should be part of the treatment. Removal of a rib he did not consider necessary; by means of a rib retractor the intercostal space could be enlarged and an adequate view of the site obtained.

Mr. C. A. S. RIDOUT spoke of the advantage of doing preliminary gastrostomy, especially in producing a cleaner area and one to which radium could be more satisfactorily applied. If only these cases could be seen by the surgeon at an early stage he believed radium held out a great prospect of ultimate triumph.

Mr. HAROLD BARWELL emphasised the great importance of a proper spacing of the radon needles. In dealing with the œsophagus one did not know how far the growth extended outwards, and it was very difficult to know whether all the cancer cells had been killed.

Sir JAMES DUNDAS-GRANT contended that much could be done to relieve for a time the distress of these patients, though the chance of cure was still remote. He advocated the use of the radon introducers invented by Muir, of New York. He agreed with Mr. Ridout that benefit followed preliminary gastrostomy.

Dr. J. A. GIBB read a paper on

Referred Pain of Nasal Sinus Disease.

He emphasised the importance of a knowledge of referred pain, since microbic infections resulting in the formation of pus were liable to be overlooked. He drew attention to the relation between headaches and sinus disease, a nerve frequently implicated being the fifth. Very often pain of sinus origin was treated as mere headache.

The PRESIDENT referred to a case in which a woman complained of acute pain over the mastoid. The tympanic membrane was normal and there was apparently no ear disease. Opening and draining the sphenoidal sinus caused the immediate cessation of the pain. In another case he was called to open the mastoid, but found that the cause of the pain was not acute mastoid disease, but a carious upper molar.

Mr. W. T. GARDINER (Edinburgh) said that any patient who complained of a fixed headache, especially always in the same position, should be strongly suspected of having sinus disease. Tenderness of the scalp when brushing the hair was a suspicious symptom.

Mr. H. TILLEY reminded members of his demonstration before the Section of Otology of the

Society of the nerve path discovered by Fenton and Lasser, which was responsible for the conveyance of much referred pain.

Dr. **P. Watson-Williams** said he was called to see a boy aged 14, who had very severe pain in the ear following influenza, with the view of a mastoid operation. There seemed to be nothing wrong with the ear, so other advice was sought. The boy died and suppuration was found round an infected sphenoidal sinus. He did not think one could point to any particular area as the site of pain in these cases.

Dr. **Gavin Young** spoke of the close relation of the vidian nerve to the sphenoidal sinus; in some cases there were dehiscences in the roof of the vidian canal, so that there was only the lining of the canal and the mucosa of the sphenoidal sinus between the nerve and the sinus. Sometimes pain in edentulous patients arose from tooth stumps which had been left in the jaw at the time of extraction.

Mr. **W. S. Thacker Neville** read a contribution on

Morphine and Scopolamine Anæsthesia in Nasal Operations.

In it the author spoke of 461 cases which had been operated upon by him at Greenbank Hospital, Darlington, under morphine-scopolamine narco-anæsthesia. The operations did not include tonsillectomies. In 83 out of 150 cases specially analysed in the paper, the dose given was: morphia gr. ¼, scopolamine gr. 1/100, digitalin gr. 1/50, the last two being repeated in the same dosage within an hour. He detailed the procedure followed. For a Caldwell-Luc operation he injected locally novocaine and sod. sulph. He did not use this form of anæsthesia for children under 12. Of the 150 cases, 122 suffered no pain, 18 said they had slight pain, 8 had definite pain, and 1 required general anæsthesia. The average time which elapsed between the first dose and the commencement of the operation was 1 hour 12 minutes, the shortest time being 35 minutes. The average duration of the operation was 25 minutes, the longest operation taking 70 minutes. Respirations quickened during the operation, often the pulse-rate was 140 per minute. The systolic blood pressure was raised. It was usual for the patient to talk to the surgeon during the operation. After the operation the chief complication was vomiting; it commenced many hours after, and did not call for treatment. Two died out of the 461 cases, which were described is some detail.

Mr. **T. B. Layton** pointed out that the combination spoken of by Mr. Thacker Neville was not an anæsthetic, but a narcotic. He, the speaker, did not think any operation ought to be done on the nose under general anæsthesia if it could be done under local. Local anæsthesia would never answer for any operation which involved rough handling or much manipulation of tissue. The problem was largely a psychological one. Operation should not be attempted under local anæsthesia unless quiet could be ensured.

Considerable discussion ensued on the subject of general *versus* local anæsthesia.

Mr. **Harold Barwell** read a paper dealing with the

Treatment of Inflammation in the Maxillary Antrum and Frontal Sinus.

Mr. Barwell contended that the principles which ought to underline rational methods of treating suppuration in nasal sinuses had only been slowly appreciated. He considered that the essential need was to secure unimpeded drainage of the affected cavity into the nose. Packing only interfered with this drainage. Cure took place by regeneration of the epithelial lining, hence curetting did harm, as also did strong antiseptics. Small polypoid thickenings disappeared when the required drainage had been established, though it was well to remove any large polypi. For frontal sinusitis he now performed fewer operations than he did 15 years ago; the disease seemed to have become less virulent. Acute inflammation might be of any grade of severity, since the sinuses participated in the production of the secretion of any acute coryza. In all except the mildest cases of antral imflammation the cavity should be washed out. For this purpose he used normal saline solution tinged with tincture of iodine. For very thick discharge he first introduced one or two drachms of hydrogen peroxide. Supraorbital pain was often due to antral suppuration in cases which did not show any involvement of the frontal sinus. Acute frontal sinusitis rarely required external operation; this was only called for when there were signs of external abscess formation.

The paper was fully discussed.

Cancer of Vocal Cords.

Dr. **W. Jobson Horne** read a paper on Difficulties in Diagnosis and Fallacies in Statistics in reference to Cancer of the Vocal Cords. He said that cancer was diagnosed more often than it existed, and in the larynx the error was chiefly made concerning the vocal cords. But in his early days he did not remember to have seen a case in which cancer was overlooked when it did exist. He had noted an increasing number of cases within recent years of so-called intrinsic cancer of the larynx or of the vocal cords in women. In the statistics collected by the late Dr. William Hill and himself women patients ranged from 10 to 15 per cent. of the total, though this form of cancer was previously unrecorded in women. He wondered whether the altered incidence bore any relation to change of habits, such as smoking? The first disease to be eliminated in diagnosis was tuberculosis, and this, even at the present day, was often a difficult matter. High authorities had declared that no one need be ashamed of having made the mistake. Syphilis was another disease which must be eliminated before the diagnosis of cancer of the cords was made. Syphilis and cancer of the larynx had been associated in quite a number of cases, therefore the finding that the patient had a positive Wassermann reaction might be a hindrance rather than a help in diagnosis. Tuberculosis and cancer of the larynx were, however, but rarely associated in the same patient. With regard to the differentiation of innocent from malignant tumours of the cords, one type of tumour took the form of an excrescence or outgrowth on the cord; it might be sessile or pedunculated or condylomatous. The cord was mobile. Radium applications gave good results in its treatment. If this condition was malignant, the degree was so mild that thyrotomy showed 100 per cent. of permanent cures. In statistics this form of tumour should be kept separate. Sections from growths for diagnosis should always be cut at right angles to the cord, and should include actual cord substance.

Dr. **Horne** showed a number of photomicrographs on the screen to support his thesis.

The subject was discussed by Sir **James Dundas-Grant**, Mr. **T. B. Layton**, Mr. **R. A. Worthington**, Dr. **Andrew Wylie**, Mr. **M. Vlasto**, and Mr. **H. Tilley**.

Mr. **O. Popper** read a paper entitled Bloodless Tonsil Enucleation, and showed a guillotine of new design.

A number of clinical cases were discussed.

EDINBURGH OBSTETRICAL SOCIETY.

At a meeting of this Society on May 8th, with Dr. **Haig Ferguson**, the President, in the chair, a paper on

STILLBIRTH AND NEONATAL DEATH

was read by Dr. **Chalmers Fahmy** and Dr. **Elsie Crowe**. It was based, they said, on a study of 300 cases from the Royal Maternity and Simpson Memorial Hospital, Edinburgh. Of the total number, 248 fœtuses were born at, or near, full term, while 52 were definitely premature. In order to keep in prominence the clinical aspect of the investigation, the cases were classified according to the manner of delivery, the 248 fœtuses born at, or near, full term being grouped as follows :—

—	Still-born.	Neo-natal.	Macer-ated.	Total.
Spontaneous delivery (all vertex presentations) ..	47	16	28	91
Forceps	54	7	4	65
Breech	47	4	5	56
Cæsarean section	8	5	0	13
Craniotomy	23	0	0	23
Total	179	32	37	248

Dr. Fahmy and Dr. Crowe drew attention especially to *the frequency of intracranial hæmorrhage in cases of* normal spontaneous delivery. It would be seen, they said, that there were 47 stillbirths in the group of spontaneous delivery, all being vertex case presentations. Eleven of these deaths were due to intracranial hæmorrhage and 15 to asphyxia, whilst in 8 of the latter some intracranial hæmorrhage was also found. Acute anæmia was thought to be the cause of death in 4 cases, in each of which labour was complicated by antepartum hæmorrhage and no cause for death was found other than the pale and anæmic state of the fœtal organs. The history was given of a number of cases of easy labour in which death was due to intracranial hæmorrhage, and it was pointed out that in parous women the fœtal head might be driven through the pelvis, from brim to outlet, in a short space of time after rupture of the membranes, this rapid descent predisposing to hæmorrhage. Such a rapid passage of the head was not unlike that occurring during a breech delivery, which was recognised as a cause of cranial injury. The number of neonatal deaths in infants born at, or near, full term was 16 ; and of this number 7 were due to intracranial hæmorrhage. The association of intracranial hæmorrhage with asphyxia was noteworthy. Often it was hard to say which factor predominated but the two conditions were frequently found in combination. This pointed clearly to the necessity of treating asphyxiated infants with great gentleness, whether they were born white or blue. That infants born pallid should be treated as if in a condition of shock was well recognised, but the speakers did not think that equal care had hitherto been deemed necessary for those born with blue asphyxia. Such infants might be suffering from intracranial hæmorrhage as well as asphyxia, and methods of artificial respiration, such as Schultze's and Byrd's, should not be practised. Intracranial hæmorrhage was occasionally found with pulmonary disturbance in infants surviving only a few days, and it was possible that this hæmorrhage, by depressing the respiratory function, might predispose to partial atelectasis and also to patches of pneumonia.

Mr. D. STEWART MIDDLETON read a paper on

Ureteric Dilatation of Pregnancy.

Until a few years ago, he said, the dilatation of the ureters commonly associated with pregnancy had only been noted in post-mortem specimens, but pyelo-ureterography had now demonstrated that it occurred in about 85 per cent. of pregnant women. The right ureter was usually alone affected, but the condition might be bilateral, the left ureter becoming dilated much later in pregnancy. Mr. Middleton strongly favoured the theory that the ureters were affected by the factors acting on the uterine musculature throughout pregnancy—namely, muscular hyperplasia combined with diminished contractility. The greater dilatation on the right side might be accounted for by torsion of the uterus. During the puerperium the muscular hyperplasia would, of course, retrogress, and mobility would be re-established immediately after delivery. It was clear that the thickened ureter, already showing connective tissue hyperplasia and exposed to a good deal of trauma during labour, would sometimes become so far fibrotic as to cause ureteric stricture and thus perpetuate what was otherwise a temporary hydro-ureter. In Mr. Middleton's opinion acute pyelonephritis of pregnancy was due to chronic colonic stasis which allowed the absorption of *Bacillus coli* from the gut and ended by the infection of a vulnerable dilated ureter during excretion of these organisms from the blood via the renal tract. Raising the foot of the bed might have a beneficial influence by decreasing any tendency to pressure on the lower ureter by the lower pole of the uterus. Most cases of pyelitis responded to simple treatment, but in more serious ones the dilated ureter must be drained. It was now seldom necessary to induce abortion or premature labour for pyelitis. At the same time, steps should be taken to treat the stasis in the proximal colon wherein lay the origin of the infection.

Mr. Middleton attributed idiopathic hæmaturia of pregnancy to compression of the veins in the renal pelvis with a corresponding rise in the arterial tension. This would from time to time give rise, he said, to rupture of a small vessel. He gave details of four cases of hæmaturia during pregnancy and showed that catheterisation of the ureter and aspiration of the renal and ureteric residual urine would, as a rule, cut the hæmaturia short. With regard to ureteric stricture he was inclined to emphasise the close association of stricture with multiparity. Before coming to this conclusion he had collected all the pyelograms made in the Electric Diagnostic Theatre of the Royal Infirmary which showed a dilatation of the ureter which was due to stricture. It was found that in these cases the patients were multiparæ, the dilatation in all but two being confined to the right side. This corresponded accurately with the incidence as regards sides of the simple dilatation of pregnancy. None of the patients had suffered from acute pyelitis during pregnancy, but the symptoms could be shown to have developed shortly after a confinement. Mr. Middleton thought that the symptoms of a stricture of the ureter were divided into two syndromes: (1) idiopathic hæmaturia of pregnancy, and (2) pain in the renal region usually on the right side, occurring in a multiparous woman, and varying from a mild backache to pain so severe as to suggest renal colic. The pain often began as backache during a pregnancy and became intensified during successive pregnancies. In more than half the cases no abnormality would be found in the urine, and the decision to make a routine urological examination must be based on the symptoms and not on examination of the urine.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF SURGERY.

A MEETING of this Section was held on May 26th, with Mr. R. A. STONEY, in the absence of the President, in the chair.

Cerebral Symptoms in a Boy.

Prof. H. F. MOORE and Mr. C. J. MCAULEY showed a boy, aged 15 years, who, five years before admission to the Mater Hospital, had sustained a head injury with a scalp wound in the left parietal region.

Two years later he began to suffer from twitchings of the right side of the face, right eye, and right arm. The twitchings were preceded by an aura of taste, but the boy never lost consciousness. He had one of these attacks while in hospital, and for some time after it he had considerable difficulty in speech.

On examination an irregular defect could be felt over the upper part of the left parietal bone. There was paresis of the right arm with distinct astereognosis. The boy walked with a hemiplegic gait and the abdominal reflex was absent on the right side. Babinski's sign, ankle- and rectus-clonus were present. Examination of the eyes revealed double optic neuritis with advancing atrophy, the latter being more advanced in the left eye. The Wassermann reaction was negative. Radiographic examination showed convolutional atrophy but no shadow of a bony depression. A diagnosis was made of a cerebral lesion involving the lower part of the left Rolandic area, possibly post-traumatic.

Operation was performed by Mr. McAuley. A large scalp flap was turned down over the left fronto-parietal region. There was an irregular linear defect in the upper part of the left parietal bone, through which a bluish membrane presented. The defect was enlarged, the extreme thinness of the skull being noteworthy. The membrane, when incised, proved to be the dura mater and some fluid escaped under moderate tension. The underlying brain was œdematous with flattened convolutions. Through the soft brain tissue a firm nodular mass in the interior of the frontal lobe could be palpated. The pial vessels were ligatured and the brain incised. The tumour was then gently enucleated. It weighed 98 g. and on section proved to be a tuberculoma.

The boy made a complete recovery, said Mr. McAuley, and had had no twitchings since the operation, power having remarkably increased in the right arm.

The CHAIRMAN said that the preliminary symptoms in this case were difficult to explain in view of the pathological findings. It was interesting to note the large size of the tumour and the consistency of it. Tuberculomas were usually small, and as they got bigger, they turned into definite abscesses.

Mr. WILLIAM PEARSON said he thought the prognosis in this case was very good, and asked if there had been any urinary trouble. During the late war he had seen a large number of frontal lesions, and the patients had almost invariably suffered from disturbances of micturition.

Mr. A. A. MCCONNELL said that in his experience tuberculomas were rare, and the prognosis usually bad, owing to the presence of multiple tumours and the onset of dissemination. He thought that in the present case the patient would probably remain well, as if dissemination had been going to occur it would have taken place by now.

Prof. MOORE, in reply, said that the weakness of the internal rectus had now quite passed away and the Babinski sign was absent.—Mr. MCAULEY, in reply, said he understood that the boy had at one time some nocturnal incontinence, but on admission to hospital this had disappeared.

Non-parasitic Cysts of the Liver.

Mr. F. J. MORRIN reported two cases of polycystic disease of the liver occurring during the third and fourth decades in sisters.

The family history revealed that the father died of pernicious anæmia, and a sister died at the age of 25 from some obscure abdominal complaint. One case was an abdominal emergency. At operation a ruptured parovarian cyst was found. The liver showed extensive polycystic disease, and in addition there were cysts in the transverse mesocolon and a cyst below the left kidney. The other patient complained of attacks of right-sided abdominal pain and vomiting. Operation disclosed polycystic disease of the liver and localised inflammatory reaction over some large cysts in the right lobe. In this case functional liver tests showed no deviation from the normal.

It was considered probable, said Mr. Morrin, that the condition was a developmental anomaly, the familial association of the reported cases lending support to this view. It was hard to diagnose owing to the absence of jaundice and freedom from digestive disturbance; whilst functional tests in one of his own cases showed that the pigmentary, glycogenic, and excretory function of the liver was unaffected.

The CHAIRMAN said the question of polycystic disease of the liver and kidneys was of interest from an embryological point of view, and he personally had always been of opinion that these diseases must be due to some congenital abnormality. The fact that the fluid contained in the cysts was of a more or less non-biliary character pointed, he thought, to the presence of cells not normally found in the liver.

Mr. MCAULEY said he thought that a large number of cases of polycystic disease of the kidney were associated with polycystic disease of the liver.

Dr. A. B. CLERY said that Dr. Lindo had suggested that the disease was due to the maldevelopment of mesoblastic tissue in the fourth month of life.

Mr. MORRIN, in replying, said that according to the literature no autopsies had been performed in cases of polycystic disease of the liver except in children, but the oldest patient operated on for the condition was 82. In the great majority of cases the condition did not lead to early death, though the more severe cases died in early life.

Radium Technique.

Mr. W. C. STEVENSON summarised the results of 15 years' work with radium, during which time he had treated 824 cases of cancer, 531 scars and injuries due to gunshot wounds during the late war, and 607 cases of non-malignant disease, making, with the cases treated this year, a total of 2143 cases.

While the technique was comparatively simple, the physical properties which govern radiation must be fully appreciated if disaster was to be avoided. He laid stress on the importance of obtaining uniform radiation and efficient treatment without over-dosage —for new growth was stimulated by too small doses— and the closest coöperation between the "radio-surgeon" and the specialist. He showed six patients; in three of these an apparent clinical cure of cancer of the tongue, involving the floor of the mouth, and one of cancer of the lip, had been obtained by inserting six iridio-platinum needles containing 54 mg. of radium element, combined with surface application. In another case of cancer of the tongue, a cauliflower growth had disappeared after ten days' treatment. A recent case of extensive cancer involving the whole upper lip amd mucous membrane of cheek was also shown, in which 12 needles containing 1 mg. of element each had been employed in three positions during 18 days. The growth in the lip had disappeared and most of the growth in the cheek.

The CHAIRMAN said that in cases of carcinoma of the tongue there was at present a great tendency to recommend radium rather than operation. Operation in these cases entailed considerable risk, and if it was possible to get something which was at least as certain of doing good and of preventing recurrence without operation, he thought it should be recommended. When, however, he came across a case of early cancer of the tongue which could be removed by a partial excision of the tongue, he did not feel justified in advising radium treatment, as in these cases it was possible to remove the growth at operation without producing any material deformity and cure could be promised. There was also a certain class of case in which great assistance was derived by either radium treatment or X ray treatment in rendering inoperable cases operable.

Dr. MAURICE HAYES also emphasised the danger of radiotherapy in inexperienced hands. The whole physics of radium should be thoroughly understood before the treatment of disease by this means was attempted. Radium burns, which were one of the chief dangers, could often be healed by the application of normal saline solution. Referring to the merits of radium-therapy versus operation, his view was that if a malignant condition was operable, surgery was preferable, except in the case of cancer of the tongue, where radium treatment left the tongue normal and speech unimpaired.

Mr. MCAULEY said that cases of epithelioma of the lip, whether early or late, benefited by surgery, but as cases of carcinoma of the tongue and floor of the mouth were practically never seen in the early stages they did better by radium treatment. It was a mistake to treat these cases by radium without excising the glands in the neck beforehand.

Mr. ARTHUR CHANCE said he was convinced that radium was the correct treatment for all cancers of the tongue except in very advanced cases where cure by any treatment was out of the question and the use of radium would discredit its value. Radium treatment was less dangerous than surgical removal and produced a better and less deforming immediate result. The ultimate results of surgery in cancer of the tongue could scarcely be worse, and time alone would show what they were with radium. A careful toilet of the mouth should precede radium applications; to extract a septic stump after radium application was to ask for septicæmia, as the vitality of the surrounding irradiated tissues favoured its development.

Mr. STEVENSON, in reply, thought there was a risk in doing operations after radium treatment. He had found saline useful for radium burns although some patients complained of pain following its application.

Reviews and Notices of Books.

SURGICAL PATHOLOGY.

By CECIL P. G. WAKELEY, F.R.C.S. Eng., F.R.S. Edin., Hunterian Professor, Royal College of Surgeons of England; Junior Surgeon, King's College Hospital; and ST. J. D. BUXTON, M.B., B.S. Lond., F.R.C.S. Eng., Junior Surgeon and Junior Orthopædic Surgeon, King's College, Hospital. Bristol: John Wright and Sons, Ltd. 1929. Pp. 904. 45*s*.

THE authors of this new text-book of surgical pathology have tried to put forward an account of the pathological side of surgery which will help readers with their clinical work. One of the many difficulties to be surmounted in the attempt to achieve this object is the regrettable fact that the pathogenesis of so many conditions is still unknown, though explanatory theories abound. The authors have succeeded well in their task and their impartial attitude towards controversial subjects is praiseworthy. They could not consider fully all the conflicting theories which confronted them without making the book so cumbersome as to be of little value to a student, and prominence has therefore been given, in each argument, to that theory which at the moment seems the most reasonable, other and less important theories being mentioned in passing. In this way the student who reads this book is prevented from such bewilderment in face of a large array of contradictory ideas that he forgets the central and essential fact that the cause of the condition he is studying is unknown. Another aim of the authors has been to connect the reading of pathology with the examination of museum specimens, and to this end the selection of illustrations has been most carefully designed. Many of them are new and have been made from specimens in the Museums of the Royal College of Surgeons and of King's College, while most of those which have previously appeared elsewhere have been taken from the *British Journal of Surgery*. The drawings, whether in colour or monochrome, and their reproductions, could hardly be improved. The diseases of bone are illustrated by many excellent X ray photographs.

The arrangement of the text follows orthodox lines and on the whole the space given to each subject is proportional to its importance. Perhaps some of the later chapters of the book have suffered compression as a result of the very large amount of space devoted to the pathology of bones (about one quarter of the whole book); but one would not willingly curtail this section, since it is uniformly excellent. The differentiation between rare and common conditions is well preserved. The classifications adopted are sound and they have been simplified as much as possible—a method which has its dangers, as the section on aneurysm shows. Here aneurysms of the aorta and of the peripheral arteries are considered together and the commonest cause of weakening of the vessel wall is said to be atheroma in a syphilitic man. This statement is at variance with the fact that we have no evidence that peripheral aneurysms are due to syphilis. Much of this particular section is rather confusing and it is below the high standard reached in the rest of the work.

The printing and binding of the book are excellent.

KER'S INFECTIOUS DISEASES.

A Practical Text-book. Third edition. Revised by CLAUDE RUNDLE, O.B.E., M.D. Lond., M.R.C.S. Eng., L.R.C.P. Lond., D.P.H., Medical Superintendent, City Hospitals and Sanatorium, Fazakerley, Liverpool. London: Humphrey Milford, Oxford Medical Publications. 1929. Pp. 614. 30*s*.

THE prolongation of the life of a text-book after the death of its author is indicated only in standard text-books of the highest class. The practical progress made during the past decade in the scientific handling of infectious diseases has not, however, involved any changes in definition, and the mass of important clinical detail collected by trained observers remains as the essential foundation of our knowledge of their epidemiology, course, and prognosis. The disappearance from current medical literature of Ker's classical work would therefore have been a calamity, and the publishers are fortunate in having been able to draw upon the ripe experience of Dr. Rundle in the work of revising a new edition. The format has undergone a change, the size having been reduced at the expense of the spacing of the type and of obsolete subject matter.

The result is a less bulky and cheaper work which, moreover, contains much new information, especially from the bacteriological and immunological standpoints, on scarlet fever, measles, diphtheria, small-pox, chicken-pox, vaccinia, erysipelas, and typhus. The number and size of the illustrations remain the same, the only new feature being that the coloured plates of the Schick test (after Zingher) in the second edition are now replaced by those which originally appeared in the Medical Research Council's monograph on diphtheria. Dr. Rundle has succeeded in retaining Dr. Ker's individual style, and while he has incorporated his own views on a few points, for example, on the infectivity of chicken-pox, due prominence is always given to the opinions of others. New facts are clearly set out with a due sense of relative importance. We could have wished for more information about the therapeutics of scarlet fever antitoxin, and even active immunisation in diphtheria, of which Ker was the pioneer in this country, could perhaps also have been treated with more detail. Post-measles encephalitis which, though admittedly rare has recently received much attention because of its resemblance to post-vaccinal encephalitis, is not mentioned among the complications of measles. Among laboratory methods now almost obsolete is the microscopic Widal test, for the sedimentation test is now exclusively used in most laboratories.

Dr. Rundle is to be congratulated for having prolonged the useful life of a text-book of which the fame is well deserved.

THE NEW HEALING.

By WILFRID A. STREETER. London: Methuen and Co., Ltd. 1929. Pp. 238. 7*s*. 6*d*.

THIS book is a polemical work in which the author condemns all other methods of healing except osteopathy, and makes claims for the recognition of the osteopath as a practitioner of healing acknowledged by the law. As it is a popular work and in the author's words "not a text-book of osteopathy," we find in it no statement of any pathological data upon which the claims of osteopathy to be considered a science can be based. The author attacks the General Medical Council and incidentally takes up the case of Dr. Axham, although the latter had, as far as we know, no connexion with any osteopath. But as the book contains a photograph of Sir Herbert Barker and the author walking side by side, we may assume that bonesetters are admitted as brethren who, not having received the necessary six years' training in an osteopathic college cannot, like the genuine practitioner of osteopathy, "achieve its greatest results in acute diseases such as pneumonia, influenza, and tonsillitis." For the osteopath shrinks from the practice of no special department. He professes to relieve deafness, and to be more successful in obstetric medicine and surgery than the regular practitioner.

It is no doubt desirable or almost necessary for the practitioners of all quack systems to try to establish a grievance. Hence the writer of this book complains of the General Medical Council and the state of the law in this country, but he apparently ignores the truth that there is no law or regulation which prevents the osteopath or the chiropractor practising his methods on any who choose to submit themselves to them. Mr. Streeter has not much respect for chiropractic or chiropraxy, which is an offshoot from osteopathy, but it seems to us that the newer cult has as much right to recognition as the older, and if chiropraxy were recognised and established, no doubt another offshoot would appear and clamour for recognition. The last chapter in the book is perhaps the most valuable, for in the form of "An Osteopathic Catechism," it enables us to estimate how trivial are the claims of osteopathy to recognition as therapy based on exact observation and scientific reasoning. The photographs in this book of imposing hospital, college, and sanatorium buildings in the United States are evidence of the extent to which osteopathy has gained hold over a section of the American public.

BLOOD-VESSEL TUMORS OF THE BRAIN.

By HARVEY CUSHING, Professor of Surgery, Harvard Medical School; and PERCIVAL BAILEY, Associate Professor of Surgery (Elect), University of Chicago. London: Baillière, Tindall and Cox. 1928. Pp. x.+210. 34*s*.

THE specialist would be the first to admit a collector's pleasure in the rare and bizarre manifestations which variegate the humdrum of his routine. In a sense blood-vessel tumours of the brain are "collectors' pieces," being not only rare, but almost sensational in their clinical aspects. The study of these remarkable growths arouses an interest which is all too seldom evoked by a surgical monograph.

The authors divide the blood-vessel tumours of the brain into two main groups: (1) the angiomas, and (2) the angioblastomas or true neoplasms. The former may be supposed to have arisen at a later stage of development than the latter, and always contain traces of compressed nerve tissue between the vascular loops comprising the lesion. The angiomas may be divided into those: (1) chiefly capillary (telangiectatic); (2) chiefly venous (angioma venosum); and (3) arteriovenous (angioma arteriale). All these tumours are commonly situated in the cortex of the cerebral hemispheres and their proximity to the motor cortex is responsible for the frequency of Jacksonian convulsions in their symptomatology. Capillary angiomas are of no great clinical significance, but both venous and arteriovenous angiomas present distinctive clinical features. The venous angiomas are not usually associated with increase of intracranial pressure, but sometimes a cutaneous angioma is present in the area of distribution of the trigeminal nerve on the same side; if calcification of the tumour occurs a characteristic radiographic appearance is presented. In the absence of these distinguishing features a venous angioma is unlikely to be diagnosed before operation, and will more probably be exposed unexpectedly in the course of craniectomy undertaken for Jacksonian epilepsy. The arterial angiomas, on the other hand, may often be recognised by an audible bruit and by the effects of the arteriovenous communication upon the intracranial and general circulation. These effects include papillœdema, unilateral exophthalmos, extracranial vascularity superficial to the tumour, increased carotid pulsation, and even cardiac enlargement. The large majority of angioblastomas are cerebellar and conform in their symptomatology with other cerebellar tumours. They may be solid or cystic; in the cystic form the cyst characteristically contains a mural nodule of solid growth. A certain proportion of cerebellar angioblastomas, as Lindau first showed, are associated with angioma of the retina, and other congenital malformations may be present, such as angiomas of the spinal cord, cystic kidneys, cysts of the pancreas, and hypernephromas.

Dr. Cushing and Dr. Bailey, whose book contains many excellent illustrations, discuss fully the pathology and treatment of these vascular growths. The angiomas, on account of their extreme vascularity, have so far proved too difficult a problem for surgery, but it remains to be seen whether electrosurgical methods may render their extirpation possible. Decompressive procedures, however, have a definite value in treatment and radiotherapy is worth a trial. Surgical methods are more easily applicable to the angioblastomas. Suboccipital decompression with cyst evacuation may give great relief, and it would seem possible to remove the tumour itself in some cases without undue loss of blood.

INFANT FEEDING.

Modern Methods of Feeding in Infancy and Childhood. Second edition. By DONALD PATERSON, M.D., M.R.C.P., and J. FOREST SMITH, M.R.C.P. London: Constable and Co. 1929. Pp. 149. 7*s*. 6*d*.

THE first edition of this volume of modern medical monographs appeared in 1926, and has well established itself as one of the most useful and practical of the shorter books on this subject. The second edition is larger by some 40 pages, and contains additions which considerably increase its utility and completeness. The original chapters on infant feeding have undergone slight alterations, involving a revised account of vitamins and more detailed attention to the use of condensed milks and acid milk. The principal addition to the book consists of an account of the diets of older children, both in health and in various forms of disease. These chapters are admirably clear and practical, giving definite indications of the quantities required, and stressing common dietetic errors such as excess of carbohydrate and of milk. They should be of special assistance to recently qualified practitioners, whose views on the subject are generally somewhat hazy.

STEPHEN HALES, D.D., F.R.S.

By A. E. CLARK-KENNEDY, M.D., M.R.C.P. Cambridge: The University Press. 1929. Pp. 256. 15*s*.

Stephen Hales, though not a medical man, occupies a place midway between Harvey and John Hunter as an experimental philosopher. The world has had to wait a long time for an authoritative biography of this eighteenth century parson, but Dr. Clark-Kennedy, Fellow of Hales's own college (Corpus Christi, Cambridge), has now supplied one. It is an admirable piece of work. The author was entrusted with the pious duty of delivering at Corpus an address on Hales on the 250th anniversary of his birth in 1927, an address which was subsequently published in THE LANCET. Many more facts accumulated than could be used in the time at the orator's disposal; he has now collected the results of his researches in book form. When Hales went to Cambridge as an undergraduate Newton was still at Trinity; shortly after, Whiston succeeded to the Lucasian professorship. In 1700 Richard Bentley was elected Master of Trinity, while Stukeley, the antiquarian, was a junior undergraduate and friend of Hales. The latter's ecclesiastical career began in 1709 when he was appointed perpetual curate of Teddington; this cure he served for more than 50 years; he was an industrious parish priest, who not only did his duty by his parishioners in his church work but was insistent in correcting parochial abuses. He was liberal in undertaking the greater part of the expenses incurred in enlarging the parish church. Like most other eighteenth century parsons, Hales was a pluralist; besides Teddington, he held the living of Porlock for four years and was then instituted to that of Farringdon. Dr. Clark-Kennedy gives an account of Hales's diversity of work on animal and plant physiology and on the ventilation of gaols and ships, as well as of his part in the development of Georgia. Hales was a most industrious and versatile worker. His well-known experiments on the *blood pressure* in horses were oddly enough the outcome of an attempt to discover the cause of muscular movement. Twenty-two years after his first experiment was performed his "Hæmostatical" papers were read before the Royal Society. In 1735 he was appointed one of the trustees to inquire into the efficacy of Joanna Stephens's medicines for the relief of the tone; together with the President and Censors of the Royal College of Physicians, and Cheselden, Cæsar Hawkins, and Samuel Sharp, and many notabilities among the laity, he must share the reproach of allowing Parliament to grant a large sum of money to a quack.

The book is well printed and contains numerous fine illustrations; it will be welcome in many quarters and reflects great credit on its author.

SYPHILIS: ITS INDIVIDUAL TREATMENT.

Die Individualisierung in der Luesbehandlung. By Dr. OSKAR D. GÜNSBERGER, Osijek. Leipzig and Wien: Franz Deuticke. 1928. Pp. 60.

THIS brochure is distinguished by a refreshing originality of outlook. The author draws a sharp distinction between the claims of the individual and those of the State. When these claims coincide, as fortunately happens quite often, no difficulty arises, but when they conflict, the author decides wholeheartedly in favour of the social standpoint. He treats syphilis as a "plague" and demands compulsory treatment, isolation, and internment to prevent harm to the present and coming generations; but he scarcely justifies his case by comparing syphilis with leprosy.

In his review of the value of various medicaments, Dr. Günsberger assesses their value in terms of satisfying both the individual and the social claim, and for this purpose he proposes a division into five periods: (1) of local prophylaxis; (2) of preventive therapy; (3) of abortive therapy; (4) of infectious manifestations; and (5) of non-infectivity (late latency). From the point of view of treatment, this division is much to be preferred to the old primary, secondary, and tertiary stages, which are no longer valid either clinically or pathologically.

Taking the author's periods in succession: (1) is known the world over and needs no extolling; prevention is better than cure, and cheaper; (2) is the treatment by "spirocid" or salvarsan of the disease during its first incubation period, to which the obvious objection is the absence of evidence of disease, and the natural reluctance to give treatment where in fact no disease may be present; (3) is when the patient consults his doctor, say, about the seventh week after contact with unmistakable signs of infection, when the arsenical remedies energetically and properly applied do produce complete cure; (4) Here treatment consists of a series of cures at suitable intervals, using as many and as various chemotherapeutical preparations as possible. Supervision alone may be required in the third and fourth year. In the fifth year a pyrexial cure winds up the treatment. The author deprecates with reason the long-sustained use of any one preparation for fear the spirochæte should adapt itself to that remedy. The diminished potency of mercury just before the introduction of salvarsan is ascribed to this cause—a thesis as difficult to prove as to disprove. He fails to understand why if a remedy cannot achieve sterilisation in, say, a month, it should be expected to do so in a year. (5) In the period of late latency supervision is better than treatment and pyrexial methods are the only hopeful measures except in some special cases, as severe infection in women who are suckling. In any case the treatment must be strictly individualised and directed to the manifestation of disease in the several organs.

Dr. Günsberger has much to say regarding the immunity factor in syphilis, which has, we must admit, suffered neglect of recent years, although we have not yet reached his sureness as to the methods by which shock therapy achieves its happy results. If his stimulating treatise brings back the reader's mind to first principles, and helps him to estimate the values and the potentialities of modern treatment, the author will have rendered a signal service to his generation. The book should be read with profit by every worker in the field of lues.

SPINAL ANÆSTHESIA.

By CHARLES H. EVANS, M.D., Clinical Assistant, N.Y. Post-Graduate Medical School and Hospital. New York: Paul B. Hoeber. 1929. Pp. 203.

SPINAL anæsthesia was acclaimed enthusiastically nearly 20 years ago, but the method fell into disrepute and has been banished altogether from many clinics. The discovery of less toxic drugs, improved technique and a better understanding of the principles of the method have led surgeons once more to explore its possibilities for general abdominal as well as lower extremity surgery. This monograph by Dr. Evans makes no real attempt to survey the different techniques which have been devised to analyse them and appraise their respective worth. Instead he deals very fully only with one technique of which he has had considerable personal experience, and this is probably wise. He has assisted at between 800 and 1000 operations under spinal anæsthesia, and only one of these has been followed by lung complications. Presumably not many of them were operations near under the diaphragm; if they were all concerned with the lower limbs the immunity from chest sequelæ would not be astonishing. In an extensive search of the literature Dr. Evans could only find two accounts of permanent nerve lesions attributable to spinal anæsthesia. We agree that reports of such lesions are reassuringly rare, especially when novocaine has been used. Dosage by weight is recommended; probably the dose could be graduated according to the size of the spinal canal, since the maximum dose ever given is far below the toxic dose of novocaine. The intramuscular injection of adrenalin is preferred to ephedrine for maintenance of the blood pressure, and is worth trial by other surgeons. A list of the operations performed would have been of interest. In 17 cases which are selected to illustrate the effect on blood pressure and pulse, the lowest pressure recorded was 44 mm.Hg and the next lowest 62 mm. Hg, but in only four of these was anæsthesia induced in the higher part of the spinal cord for upper abdominal operations. The information really needed is the average fall of blood pressure when high anæsthesia is induced. Dr. Evans is an enthusiast and appears rather to belittle the dangers and complications of this method, but since many other writers have perhaps erred in the other direction the reader who has followed the literature of the subject is not likely to be misled into taking a too optimistic view of this technique.

THROMBO-ANGIITIS OBLITERANS.

Clinical, Physiologic, and Pathologic Studies. By GEORGE E. BROWN and EDGAR V. ALLEN, Division of Medicine, Mayo Clinic. Collaborating in Pathology with HOWARD R. MAKOMER, Fellow in Surgery, The Mayo Foundation. London: W. B. Saunders Company. 1928. Pp. 219. 14s.

THE debt which medicine already owes to the Mayo Clinic is increased by the publication of this monograph, which is based on a study of over 300 cases of thrombo-angiitis obliterans. It contains an account of pathology, symptoms, and treatment which is a model of balance and lucidity. The increasing frequency of the disease is pointed out, and the authors show, what is already recognised in this country, that, while Hebrews are the predominant sufferers, no race is immune. The cases dealt with in this study are limited to the male sex, and the conditions causing this limitation are discussed. The authors support the view that thrombo-angiitis is an infective condition and offer tentative evidence of a specific micro-organism. A strong plea is made for early diagnosis, which is increasingly important since non-specific protein therapy and lumbar ganglionectomy have brought a more hopeful outlook. Clear descriptions of the types and stages of the disease are given, with their appropriate treatment, and the illustrations are apt. The book is a pleasure to read.

E LANCET.

SATURDAY, JUNE 15, 1929.

REATMENT OF SYPHILIS.

ıme past the feeling has been growing who are called on to treat syphilis nethods of treatment are not as satis- promised to be. With the introduction o arsenical remedies, from which such ts were anticipated, schemes of treat- id down, often with the blessing of epartments, which seemed to be de- llent lines but which in practice have dividual patients proportionate benefit. lthough widespread is not well docu- though more than a quarter of a million ilis have been dealt with in the various atres of England and Wales, no serious been made (with one notable exception) he results in relation to the treatment . Two main deterrents have coöperated this sparseness. Few clinics provide terial from which to draw trustworthy and the work of analysing the material rious. The diversity of practice which s seems to be largely due to a general wledge of the end-results of the various atment advocated by different workers; well have another contributing cause, lies deep in the structure of medical mely, the hardship to anyone engaged nent of individual cases of syphilis when not to modify his scheme by the results vidual experience. It is a temptation e resisted only by a few, to try out some r of the new preparations which flood arket, and already the value of Ehrlich become obscured by the preference majority of workers in this country for this, while admittedly less potent, venient not merely for the administrator its lesser potency is more than offset er ease of retaining the continued atten- tients submitted to it. It was for this the committee of experts appointed by Section of the League of Nations set llection of new data upon a standard basis for an evaluation of the results . But before this Committee began L. W. Harrison had already begun he records of St. Thomas's Hospital, y is now issued as a special report to Research Council.[1] Even this analysis cases has been complicated by irregu- dance and other factors.

standard unit of treatment a course n 5 grammes of an arsenobenzol com- ed with a minimum of 5 grains of grammes of bismuth over a period four months, Dr. Harrison's analysis en in primary cases which have never ve Wassermann reaction, good results pected from less than two full courses, se cases in which the W.R. had already even three full courses were not altogether satisfactory. Relapses it is found occurred mostly in the first year, and after the second the risk appeared comparatively small, but while examples occur of the eradication of syphilis with very small total dosages the fact remains that considerable amounts administered regularly over years failed to save the patient from late results. Given consecutively bismuth displayed no greater efficacy than mercury as an adjuvant to arsenobenzol; simultaneous administration, however, of arsenobenzol along with mercury or bismuth produced a series of cases which never showed clinical signs of neurosyphilis. The numbers on which both these deductions are based are admittedly small, but if an extended experience should confirm them their importance is fundamental. At present they do not refute the dictum of Nonne, who has always maintained that chemotherapy alone is powerless to prevent the late nervous manifestations of syphilis. A negative W.R. of blood and cerebro-spinal fluid is not regarded by him as evidence that syphilis has been cured, for the great vessels may continue to show damage in despite of these reactions. In a series of post-mortem examinations of paretics during the years 1908–14 Coenen found changes of the aortic wall in 22 per cent., whereas in a later series, 1919–23, the percentage went up to 43—and the later series, not the earlier, were probably treated with arsenobenzol. In a book, which we review in another column, Dr. Günsberger of Osijek seriously raises the question whether, in regard to the occurrence of metalues, such arsenical treatment is not really harmful to the individual in so far as it increases the likelihood of late nervous complications, although from the social point of view the treatment has been successful in destroying infectivity and thus preventing the development of disease in the next generation. There is, in Dr. Günsberger's view, a certain antithesis between the treatment of the individual and the safety of the community. This social success he believes already to be have been reached in Sweden, while in Austria there seems to be some sympathy for the view that when the claims of the individual and those of society conflict the community will decide wholeheartedly in favour of the social standpoint. The decision might not be so lightly taken in this country where the life and health of the individual is still the primary concern of the practitioner, but from this dilemma there may be a relief, for there is growing evidence that in an artificially produced pyrexia, called shortly pyrexial cure, we may find a means of modifying the habit of body which leads to late neurosyphilis.

At the McGuire Clinic in Richmond, Va., Dr. S. W. Budd and C. W. Williams have reported[2] the results of administering TAB vaccine to 65 patients in various stages of syphilis, and while admitting that fever therapy alone is markedly inferior in immediate results to salvarsan alone, they suggest that in combination it offers a more hopeful outlook than drug therapy alone. They found themselves able to reverse an apparently irreversible blood W.R. in nearly one-half of the cases treated, although they observe a wise reticence as to the permanence of these results. Dr. Harrison himself suggests that greater success might be obtained by attention to the patient's tissues—that is to say, by a strict individualisation directed to the disease of the organ involved, which is an essential point in Dr. Günsberger's thesis. Neglect of the immunity factor in syphilis may have conduced in large measure to the imperfect results obtained in practice.

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[1] reatment of Syphilis. A Survey of Records from St. . Hospital. Medical Research Council, Special Report 132. H.M. Stationery Office. 1929. Pp. 83. 2s.

[2] Jour. Amer. Med. Assoc., 1929, xcii., 1737.

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PAYING A PATIENT'S BILLS.

THERE are judicial decisions which prove to be legally inevitable and yet to the uninstructed appear intolerable or ludicrous. The medical profession will form its own opinion upon the case of Maley *v.* Churcher in which the law has insisted that a doctor is personally liable for the hire of a motor-car ordered for the conveyance of a patient. Three successive tribunals—the county court, the Divisional Court, and the Court of Appeal—have come to the same conclusion, but the efforts of the Medical Defence Union will not have been wasted if practitioners are fully warned of the liability they may incur and if the statement of the law convinces the public of the necessity of amendment. It is worth while to set out the facts of the case, simple as they are, in some detail.

A young man named BOWER, 24 years of age, employed by a Mrs. CUSACK, of Eastbourne, was housed elsewhere in Eastbourne at a school called "Heatherdene" (8, Meads-street) during the school holidays. Mr. Bower had apparently tried to commit suicide by taking poison. Dr. D. G. CHURCHER, of Eastbourne, was called in and advised his return home for treatment to his father's house in Balham. The patient was in possession of his senses but hysterical, and Dr. Churcher thought it safer to send him by road rather than by rail. Dr. Churcher attempted without success to communicate with the patient's parents; he obtained the patient's authority for the hiring of the car, and he telephoned from the school to Maley Bros., motor-car proprietors in Eastbourne, in the following terms: "Dr. Churcher speaking; send me a car at once to 8, Meads-street to take a patient to Balham." The order was accepted, but some delay occurred, and presently he telephoned again, asking, "Is that car coming that Dr. Churcher ordered or not?" The car was by this time on its way. It took Mr. Bower and a nurse to Balham and brought the nurse back again to Eastbourne. At this point what was the position? Dr. Churcher knew himself to be acting as agent not as principal; he had properly obtained the patient's authority; the car proprietors knew that the order had been given by a medical practitioner, from an address which was not his own, and in connexion with the conveyance of a patient. Never having seen Mr. Bower before, Dr. Churcher was naturally unaware of his financial position; it was vitally important to send this hysterical patient back at once to the quiet of his family home, and this was scarcely a moment for prolonged inquiries It seems, moreover, that none of those concerned contemplated that Dr. Churcher had ordered the car otherwise than as agent. The car proprietors, who acted throughout in good faith and whose charge was the moderate sum of £5, evidently never thought that Dr. Churcher was to pay personally. They wrote a few days later to Mr. Bower's father at Balham a letter containing the sentence: "We are instructed that the amount for the hire of the car—£5—is payable by you." Subsequently they wrote again to him, expressing surprise that he had not paid the account, "particularly in view of our knowledge of the circumstances under which the car was ordered," and hinting at possible legal proceedings to enforce payment. Mr. Bower's father replied that the car was hired without his knowledge, authority, or consent. "My son was in Mrs. Cusack's employ, without salary, on the understanding that she was liable for his board, residence, expenses, and laundry; the hire of the car having been undertaken by herself or her agent, the expense is at her door; she paid my son's fare to Eastbourne and naturally she would have had to have paid his fare back." The father having repudiated liability, Maley Bros. wrote to Mrs. Cusack "With reference to the car ordered by you." Their letter indicates that they had already applied to Mrs. Cusack and had addressed Mr. Bower's father at her request. Mrs. Cusack replied that she ordered no car and must refuse responsibility; the money "is due from Mr. Bower himself, whose doctor ordered him to go to London by car as he was unfit to travel in any other way." Messrs. Maley in this dilemma wrote to Dr. Churcher—not to ask him to pay but to ask him to say "who you had in mind as the person responsible for ordering the car when you rang us up." Dr. Churcher replied that Mr. Bower was of age "and is responsible for the car just as he is for my fee."

The matter then found its way into lawyers' hands, and, nearly a month after the car was ordered, it was for the first time suggested that Dr. Churcher himself might be personally liable because he had not expressly disclaimed responsibility in his original telephone message. Clearly nobody would have dreamt of asking Dr. Churcher to pay if the patient had not been impecunious and if the father and the employer had not been at loggerheads. The county court judge, before whom Dr. Churcher was sued, said: "The defendant did not inform the plaintiffs that he was acting only as agent, and nothing was said as to the person responsible for the plaintiff's charges. . . . Although I am bound on the defendant's evidence to hold that he was in fact the agent of Bower, I am satisfied that this fact was not disclosed to the plaintiffs and that, unless the defendant's contention as to notorious usage is to prevail, he did not contract with the plaintiffs so as to exclude his liability as principal. The defendant gave the order without any limitation of liability and is prima facie responsible." The judge said the only defence to the claim was that a doctor acting for a patient has a character as agent so notorious that he cannot be made personally liable. Here the case of Wakefield *v.* Duckworth was considered. In that case solicitors, acting for a client charged with manslaughter, employed a photographer to make certain photographs for use at the trial; in giving the order they said: "Make your charges as low as you can, for the fellow is only a poor chap." It was then held that the photographer had no claim against the solicitors, a solicitor being notoriously agent for his client for many purposes and competent to bind him. In Dr. Churcher's case the judge refused to follow Wakefield *v.* Duckworth, or to take judicial notice of the fact that a medical practitioner acts as agent for a patient. The two higher courts before whom the case came on appeal were really bound by the county court judge's findings of fact. Unless Dr. Churcher could argue that there was no evidence whatever on which it could be held that he had made himself liable for the car, he could not overthrow those findings. Lord Justice SCRUTTON said he would himself have decided on the facts in the same way as the county court judge had done. It was a question of fact on which there was no appeal. "The defendant had used words on the telephone which prima facie rendered him personally liable, and he did not use any words indicating that he was contracting with the plaintiffs as agent and not as principal." Dr. Churcher's appeal was thus dismissed, though not without a hint that circumstances were conceivable in which a medical practitioner's agency might be established.

There is no need here to discuss the moral liability of Mr. Bower, his father, and his employer; the matter was decided on strictly legal grounds. Had the telephone message begun, "Dr. Churcher speaking *on behalf of a patient*," or—more clearly still—"You understand that I am not making myself personally liable," the claim against Dr. Churcher could not have succeeded. Everybody knew Dr. Churcher's position, but he suffers because he did not say what everybody knew. Whatever the law may oblige judges to decide, it is in fact notorious that a doctor in such a case does not intend to make himself liable as a principal. Medical practitioners will take warning from the case and will word their communications accordingly. Meanwhile we protest vigorously against the continued operation of legal rules under which the decision against Dr. Churcher is not only possible but apparently inevitable. This may be the common law, but it forfeits something of the general confidence if it ignores matters of common knowledge and if it runs counter to what many believe to be common sense.

THE ESTABLISHMENT OF NORMAL STANDARDS.

THE plea for the establishment of a department of clinical physiology set out in another column deserves attention, for though the argument ruthlessly exposes some of the defects in the medical curriculum, its tone is neither cynical nor destructive. It is generally admitted that our present knowledge of normal Man is, from the clinical point of view, sadly incomplete; Dr. LINDSEY BATTEN believes that well directed research would systematise this knowledge and make it readily available, so that anyone seeking information as to the occurrence of a supposed abnormality would know where to turn for it, and some check would be put upon that kind of "new discovery" in medicine whose brief inglorious career brings discredit to its supporters. The paths along which research should be directed would be chosen by following closely the work of clinicians and of laboratory physiologists and pathologists, trying out their conceptions and discoveries by control experiments on large groups of normal subjects. Its second and no less important function would be to spread such knowledge as already exists, and especially to teach the dominant facts to students, not necessarily only to students of medicine. Few would deny that in spite of all the time and energy spent in teaching and learning anatomy and physiology, the student goes to the wards almost completely ignorant of the material on which he is to work—the intact human organism. Of the habits of body of men, women, and children, of their essential physiological needs and their diverse types he has been taught very little. In particular he knows nothing of normal infants and children, of the phenomena of growth, or of the changes associated with age. He goes to the wards to find himself face to face with the problem of learning simultaneously the arts of investigation, direct and instrumental (which increase almost daily in complexity), and the clinical and pathological facts of morbid processes. The period officially allotted to the study of the normal is over and he has little incentive to prolong it; yet he will get no better chance, until he embarks on practice, to form a conception of its limits from which to differentiate the morbid. What wonder if he fails to do so, and goes into practice well versed in disease but ignorant of health, and likely to mistake unusual physical or physiological types, which have never been demonstrated to him, for the effects of those pathological conditions about which he has learnt so much?

This, in brief, is Dr. BATTEN's thesis. We agree with much that he says, but we must plead at least for one concession to human weakness. Let us not be too prompt to initiate control experiments on large groups of normal subjects whenever a new theory in physiology or pathology is tentatively suggested, even if its experimental support is slender. The flame of investigation is easily quenched; since the damping disappointments inseparable from a life spent in research must be counteracted, the flame must be kept alive by a favourable wind, even if this has to be produced by fans. A worker with the robust hardness of a ROBERT KOCH is rare indeed. Among lesser men small groups tend to foregather in mutual support, hailing with unmeasured expressions of joy a result which they know to be still uncontrolled; for this stimulation is the food on which research can thrive. At the next gathering, who would be so tactless as to ask whether the experiment has been successfully repeated, unless the information is volunteered? Besides, the listener of one meeting becomes the eager informer of the next. The time for critical examination will come soon enough, when conclusions are being drawn; but even then the fact that a so-called abnormality is found to occur in 20 per cent. of ordinary persons does not necessarily exclude the possibility that it may help to cause symptoms in some of them. If many idiosyncrasies are now labelled abnormalities, it is at least possible that in the future several characteristics now passed over as proper to a certain age or sex will be found to have a pathological significance. The research division of a department of clinical physiology would have to busy themselves for some considerable time before standards of normality for teaching purposes could be devised.

Meanwhile, in the medical schools, without the addition of a new department, a new teacher, or a single hour to the curriculum, a start might be made to clear the teaching of medicine from at least some of the reproaches to which Dr. BATTEN draws attention. Most, if not all, licensing bodies insist on a compulsory course, usually held by junior members of the staff, during which students fresh from the medical school are taught the methods of clinical examination and the use of instruments such as the stethoscope and ophthalmoscope. The zealous tutor, in his anxiety to interest his pupils, selects the finest heart murmurs and the loudest lung crackles he can find to show them, and if there is an example of ægophony in the wards his happiness is complete. All these signs are wasted on his audience, who have hardly heard of any of the diseases of which they are pathognomonic, and want only to learn to hear and recognise the normal. This class should be held, not in the wards, but first in a private room, the students examining each other, and then in the special departments of the hospital when these are not in use; in this way the results of percussing the heart can be controlled by the X rays and the fundus seen through the ophthalmoscope compared with the interior of the model eye. The limits of the normal already recognised are wide enough to exercise the perceptions and descriptive powers of the class, and during this preliminary course their attention should not be distracted by the curious cases which are exciting the attention of more experienced workers. Their teacher should be a clinician still interested in physiology, and such men are not, after all, rare. In this way students will start their career as clinical clerks with a different point of view, and a clearer conception of the wide range of deviations which are still within normal limits.

Annotations.

"Ne quid nimis."

DARWIN'S HOUSE.

Down House in which Charles Darwin lived during the greater part of his life, and where "The Origin of Species" was written, was opened to the public on Saturday last. The house was presented to the British Association by Mr. Buckston Browne, F.R.C.S., on condition that it and the surrounding grounds shall be maintained in the state given to them by Darwin and that the public shall have free acccess to the public rooms. Sir Arthur Keith, who declared the house open, spoke of the way in which Charles Darwin quite unwittingly had made these few acres of Kentish upland an international possession. It was just because he permitted the bare unbusked truth to speak for itself, going only so far as the light of reason would carry him. Only men who taught thus, said Sir Arthur, continued to teach for all time. What Darwin's achievement has meant to the study of natural history is set out nowhere better than in his own words, which we here reproduce from the concluding chapter of the "Origin":

> "When we no longer look at an organic being as a savage looks at a ship, as something wholly beyond his comprehension; when we regard every production of nature as one which has had a long history; when we contemplate every complex structure and instinct as the summing up of many contrivances, each useful to the possessor, in the same way as any great mechanical invention is the summing up of the labour, the experience, the reason, and even the blunders of numerous workmen; when we thus view each organic being, how far more interesting—I speak from experience—does the study of natural history become!"

Mr. Browne's gift will enable many to recapture the atmosphere in which Darwin thought and worked for 40 years—the phrasing is in the words of an inscription now erected outside the entrance gate. No student would ever know Darwin, said Sir Arthur Keith, until he knew Down, and to see Down was the best way to obtain an introduction to Darwin's works. Most of the furniture and other objects in the rooms are those used by Charles Darwin and his family, including the snuff jar which he kept not in his study but in the hall, in the vain hope of breaking himself of the habit. An American committee is coöperating with the British Association in an endeavour to recover Darwiniana now in America.

POST-OPERATIVE RUPTURE OF THE ABDOMINAL WALL.

RUPTURE of the abdominal wall after operation is a much neglected complication, and the reason for its neglect may be that surgeons think it a reproach to their technique. A similar obscurity—now fortunately dispelled—has until recently been the fate of Volkmann's ischæmic contracture. An attempt to elucidate some of the problems connected with repair of the abdominal wall has lately been made by Monod and Kiraly,[1] who base their conclusions on cases of their own and on series collected by Chavannaz in 1900 and Madelung in 1905. The subject has a very small modern literature and not much that is old. Post-operative rupture may occur soon after the operation, usually within the first fortnight, or it may follow years afterwards. Delayed rupture is, of course, extremely rare, and is not of the same practical importance as the post-operative form. Of general causes thought to predispose to the condition, cancer is usually placed first, but in none of the three series of cases reviewed did it account for more than one-fifth of the total. Syphilis is also said to be a predisposing cause, and Monod and Kiraly found that active syphilis was present in two out of the three cases in their series in which a Wassermann test had been done. Among local causes which may predispose to rupture, infection of the wound, abdominal distension, premature removal of the sutures, and a long incision are all common; but most important of all is incomplete suture of the peritoneum. The origin of some of these cases can be easily seen during the operation of re-suture when the rupture has not been complete, and it is often found that a piece of omentum has worked its way through a gap in the peritoneal suture, thus apparently starting the cleavage. The actual rupture is usually brought about by an effort on the part of the patient, coughing and vomiting being the commonest causes. It is interesting to note that there is rarely any pain at the time of rupture, and never any hæmorrhage. In fact the patient may only feel that there is something under the dressing, or, indeed, the accident may not be noticed until it is observed that the dressing is soiled by a pinkish serous effusion. When the condition is recognised early the prognosis is not so serious as might be supposed from the nature of the accident. Immediate suture of the abdominal wall is successful and, whether it is done in several layers or in one, the result should be a firm scar if the patient survives.

THE DOCTOR-CORONER.

RECENT correspondence in the *Times* has contained criticism of the procedure at coroner's inquests. Coroners are tending, it is suggested, towards the methods of the French examining magistrate; voluntary witnesses are cross-examined by the court itself in a hostile manner; suspects are at the disadvantage that they are not definitely charged with the commission of a crime nor are they warned (as they would be by a police inspector) that what they say may be used against them in another place. While one correspondent points out that all this is contrary to ideas of British justice and fair play, another ascribes the supposed malpractices of the court to the appointment of medical practitioners as coroners. Such appointments mean, it is said, that the coroner has no legal training; even if he has sought to supplement his qualifications by undertaking the examinations which a barrister has to pass, his knowledge of the law of evidence is theoretic and not practical.

These criticisms ignore the fact that Parliament has never said that a coroner must be a practising barrister or solicitor. The qualification is five years professional standing as a barrister, solicitor, or medical practitioner. Nor has Parliament declared that the procedure at an inquest must in every way resemble that which is used at other criminal courts. For obvious reasons the inquest cannot be assimilated to the assize court. The inquest is held to inquire into the cause of death. Until it has made some headway with its investigation, it is impossible that a definite accusation against a definite person can be formulated. There is therefore no charge, no defendant, no prosecuting or defending counsel; the tribunal itself must undertake the responsibility of eliciting the facts and must necessarily rove over a wide field. The coroner, using the discretion which the law permits him, is—as Mr. Justice Wills observed in the Crewe murder case—"fettered by no precise rules of evidence"; he is "bound to collect, so far as he can, all information and knowledge of disasters from neighbours and others who can throw any light upon the cause of death . . . he can oftentimes collect evidence, facts and statements which, whether or not they may ultimately be capable of being turned into evidence against the parties who are to be put on their trial, are often very valuable as supplying material for investigation by the police and as affording clues which may lead to successful inquiry." If, continued the learned judge, a coroner confined himself to the strict rules of evidence, he would throw away a great deal of the remaining usefulness of the inquest. These observations, uttered nearly 30 years ago, are of full force to-day.

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[1] Presse Méd., 1929, xxvii., 253.

The coroner, perhaps, on his side, has a right to protest that his least considered remarks in court are sometimes torn from their context and reported with unnecessary elaboration. He tries to deal with all the aspects of the case but the reporter may be interested only in the case against a particular suspect. Doubtless there are coroners, as there are judges and stipendiary magistrates, whose running comments are no great help to the administration of justice, and whose individual views on certain favourite topics of their own (whether medical or legal) are apt to find a tediously constant expression. But the critics of the procedure at inquests make a profound mistake if they ignore the historical and popular associations of the coroner's office, or if they commit themselves to the theory that the only good coroners are lawyers and the only bad coroners are medical practitioners.

THE RED CELLS IN PERNICIOUS ANÆMIA.

THE work of Price-Jones has established that in pernicious anæmia there is an abnormally wide variation in the size of the red cells, and the presence or absence of this phenomenon may now be regarded as the absolute criterion for diagnosing the condition. The plotting of the Price-Jones curve, however, is so laborious as to be hardly feasible in a busy laboratory, whilst the "halo" method of Adrianus Pijper,[1] though affording means of demonstrating optically the same variation and the approximate average increase in size of the red cells, demands special apparatus and somewhat formidable calculations. Some time ago Haden[2] pointed out that a relatively small increase in the average diameter of the red cells causes a relatively great increase in the total red cell volume, and various workers have brought forward evidence to show that much of the valuable information to be gained from the Price-Jones curve can be got by calculations based on the total volume and total number of red cells. Wintrobe, whose work on blood standards has already been referred to in our columns, has recently dealt with the subject in a comprehensive way.[3] He points out (what has been recognised for some time) that the average corpuscular volume in cubic millimicrons may be obtained by dividing the total volume of red cells per litre, as determined by the hæmatocrit, by the total number of red cells per c.mm. The figure thus obtained he refers to as the corpuscular volume. This corpuscular volume he finds in healthy young adults to lie between the figures of 70 and 98 cubic millimicrons, with the average round about 83. In strong contradistinction to this, Haden found the corpuscular volume in pernicious anæmia to lie between 108 and *163 cubic millimicrons* with *an average of* 128. The difference between the normal red cells and those from cases of pernicious anæmia is conspicuous, and inasmuch as determination of the corpuscular volume only demands the use of a hæmatocytometer and a hæmatocrit, this particular determination bids fair to be of considerable use in establishing the diagnosis of pernicious anæmia. Wintrobe further draws attention to the interesting fact that, although the size of the red cell is increased in pernicious anæmia and though it carries a greater load of hæmoglobin than the normal red cell, the actual proportion of the volume of the red cell occupied by the hæmoglobin is no greater than in normal blood. Haden found the percentage of hæmoglobin in the red cell in pernicious anæmia to range between 16 and 35 per cent.; Wintrobe in normal blood finds very similar figures, the actual average being about 33 per cent. The proportion of hæmoglobin in the red cells is determined by dividing the hæmoglobin, expressed as grammes per cent., by the volume of red cells per 100 c.cm. of blood. Both for this calculation and for that of the corpuscular volume a hæmatocrit is required; the importance of centrifugation until the column of red cells has reached a final level is presumably apparent. Wintrobe, however, draws attention to a source of error which has possibly not been sufficiently considered. He *finds that the addition* of potassium oxalate to the extent of 20 mg. to 10 c.cm. of the blood under estimation caused a decrease in cell volume of 3·7 per cent., while addition to the extent of 40 mg. to 10 c.cm. of blood brought about a diminution of 6·7 per cent.

OBSERVATIONS ON UNILATERAL DIURESIS.

To the April number of *Guy's Hospital Reports*, Mr. H. I. Maister, Mr. W. H. Ogilvie, and Prof. M. S. Pembrey contribute a paper on a case of total cystectomy in which certain investigations were made of urinary secretion. The patient had a carcinoma of the bladder and at operation the ureters were brought to the surface. The urine excreted by the two kidneys was collected separately by an apparatus which kept the patient dry and allowed her to get about. Variations in the activity of the two kidneys were shown by estimating the volume and specific gravity of samples collected in consecutive periods of half an hour. The most interesting observation was that the application of warmth to the loin did not, as is usually supposed, produce diuresis but rather the reverse. When a hot poultice was placed over the right kidney the amount of urine excreted on that side was diminished and a diuresis was noted on the opposite side. On another occasion as a control the poultice was applied to the left side and a diuresis from the right kidney was obtained. It appears, therefore, that warmth over the loin produced a vaso-constriction of the underlying kidney and since the skin, apart from the poulticed area, was cold, a compensatory dilatation occurred with increased excretion on the opposite side. These observations are of a special interest in view of the common practice of applying warmth and cupping over the lumbar region for the purpose of stimulating urinary secretion—a method which seems likely to diminish rather than stimulate the activity of the kidneys. It may, indeed, be deduced that the application of warmth over a kidney might be of use in those cases of renal hæmaturia in which diminution of activity is thought desirable.

BOOTS AND SHOES.

ONE of the disadvantages of civilisation is to be found in the degradation of the human foot which is caused by the use of footgear. Many writers have pointed out the evils wrought by boots and shoes, *and by stockings, too, for that matter, and many an* essay has been written on the proper form and material of foot covering. The last contribution to the literature of this subject comes from Dr. J. D. Adams,[1] of Boston, who holds views on the footgear of the child which are sound as far as they go, but hardly seem to go far enough. A study of the history of boots and shoes and of the current practice in shoeing of many peoples all over the world, such as was in part attempted in our columns by Mr. Muirhead Little[2] in 1914, shows that, with the exception of sandals, all footgear tends to cause abduction of the great toe and gradual loss of the power of voluntary adduction of its phalanges. The Greek or Roman sandal with a thong between the great and second toes did not have this pernicious effect, and the same is true of certain sandals worn in India and elsewhere at the present time. The most primitive form of protection was probably a strip of the skin of an animal or some flexible leafs and the result of winding this or any other bandage round the foot and toes would be abduction of the great toe, involving in time loss of the support afforded by its phalanges. This tendency is evident in Red Indian mocassins, some of which are quite sharply pointed. The early Highland brogue, which was made out of a single thickness of deer's or other hide, had the same defect. The loss of the power of voluntary abduction of the hallux is incurred quickly because of the comparative feebleness of the so-called abductor hallucis and the mechanical disadvantage under which it acts, losing, as it does, all power of adduction after the first phalanx is abducted so that its long axis is a continuation of that of the metatarsal bone. But it is not only the great toe that has suffered from footgear. As soon as man added a stiff sole to the more or less sock-like mocassin or brogue, or made the sandal stiff, the muscles began to atrophy and the complicated musculature of the foot to lose its raison d'être. Every normal child appears to be born with active foot muscles and joints, but in every shoe-wearing adolescent the process of degradation and atrophy is gone through, until the foot becomes no more than a lever hinged at the ankle and jointed at the toes. Dr. Adams figures the radiogram of a "foot in a properly fitted shoe," but even in this a degree of hallux valgus is apparent. Such deformity is, we fear, unavoidable in all boots and shoes, and despite the provision of shoes of which the soles have straight or incurved inner edges, the hallux necessarily pressed upon at the metatarsophalangeal joint declines to avail itself of the space provided. We regretfully conclude that unless digitated stockings and sandals with toe-thongs become our only wear, we must have a more or less abducted great toe. Even the athlete's running shoe is badly shaped. Those that we have seen do not allow for adduction of the hallux and in so much sacrifice the support and propulsive leverage of the great toe.

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[1] THE LANCET, 1924, ii., 367.

[2] Haden, R. L.: Arch. Int. Med., 1923, xxxi., 164.

[3] Wintrobe, H. M.: Amer. Jour. Med. Sci., April, 1929, p. 513.

[1] Jour. Amer. Med. Assoc., May 25th, p. 1753.

[2] Boots and Shoes from Historical and Surgical Points of View, THE LANCET, 1914, i., 1738.

Men's boots and shoes may be bad, but if so, what epithet of depreciation is strong enough for the shoes of women? Now that all females are ladies, the workers among them have aped the fashions which were popular with the wealthy idlers of past generations who rode in carriages and did but little walking on their high heels and pointed toes. It is astounding that so few complain out of the millions who now for several years have been defying nature in this way.

SCLEROSIS OF THE RETINAL VESSELS.

SINCE the signs of retinal arterio-sclerosis were first pointed out by the late Marcus Gunn, this condition has been dealt with by many writers, notably by Foster Moore in 1917.[1] The subject has been reopened in a series of papers, reprinted from the *British Journal of Ophthalmology* for March, April, and May, 1929, by Dr. Noe Pines, a Russian ophthalmologist, now living in London. He distinguishes between general arterio-sclerosis in which the general blood pressure is not necessarily high and essential hyperpiesis in which it is. The two conditions, of course, are often present together, but it is the second and not the first, he argues, to which the retinal changes are due. As to what these changes are, he attaches little or no importance to the loss of transparency in the retinal vessels which is extremely common in elderly people. The alteration in the reflex which gives rise to the appearance known as "silver wire" arteries is more important but not always easy to determine. The most important signs of sclerosis he considers to be, first, white lines bordering the vessels—not on the disc or even in its near neighbourhood, as these may be purely physiological, but in the retina and especially at and near the points where artery and vein cross. These white lines he attributes to perivasculitis in the sheaths of the vessels. Secondly, signs of crushing of the veins at the arterial crossings evidenced by white lines, banking, and deflection of the veins. A number of reproductions of drawings from Hamblin's collection are given as illustrations, and this appears to be an excellent way of studying the subject. There is originality in the author's views as to the interpretation of some of the appearances. It is of interest, too, that he finds no connexion between this form of retinal disease and nephritis, and consequently does not consider the changes that he describes are premonitory of albuminuric retinitis. On the other hand, the connexion between sclerosis of the retinal vessels and those of the brain is notorious. Both depend on persistently high general blood pressure, and this again on some form of toxæmia. Once again we see that the ophthalmoscope is one of the most essential instruments of diagnosis on which the general physician has to rely.

TRANSPLANTATION OF AN EPIPHYSIS.

WE do not expect to hear of surgical novelties from the Sandwich Islands and therefore the report of a new procedure coming from Honolulu is the more welcome. Dr. G. F. Straub, of The Clinic, Honolulu, reports[1] the successful implantation of a section of diaphysis and epiphysis in 1912, as suggested by Murphy. The case was one of osteomyelitis of the tibia with consequent necrosis of the bone including the lower epiphysis, and the graft was obtained from the sound leg. As the operation was performed as long ago as 1912, a definite opinion can be formed on the value of the result. The leg, which at the age of 14 was 4·5 cm. shorter than its fellow, is now 5·0 cm. shorter, showing that growth has taken place pari passu with the sound limb. The deformity of the foot, due to unbalanced growth of the fibula before the operation, has much diminished, but there is still some calcaneo-cavus deformity. This paper is illustrated well by photographs and radiograms.

HOSPITAL MATERNITY WORK IN GLASGOW.

THE Glasgow Royal Maternity and Women's Hospital contains 114 beds, 25 of which are reserved for the antenatal department. The report of the hospital for the year 1927, which has reached us, covers the treatment of nearly 4000 in-patients and 3500 district cases, its general arrangement being based on that recommended by the Committee of the Royal Society of Medicine, in which cases which have attended the antenatal clinic and emergency cases are recorded separately. In Glasgow, however, a large number of patients apply for admission without having attended a clinic, or having been seen by a doctor or midwife, and for these it has been necessary to form a third section, numbering 700 in all. For the whole hospital a 2 per cent. decrease is recorded on the morbidity of the previous year. Comparison of the results obtained in the antenatal and emergency sections goes far to prove the value of antenatal work, particularly in centres where pelvic contraction is common. This is the case in Glasgow, for 288 cases of contracted pelvis were treated by trial labour, Cæsarean section, or forceps. Labour seems to have been induced only in six cases, in three of which no measurements are recorded, one of them resulting in the delivery of a 10 lb. baby at term in less than three hours. In two of the other three cases the pelvis is described as generally contracted although the diagonal conjugate measured 4½ inches. Cæsarean section was performed in 112 cases, mostly for contracted pelvis, eight of the operations being of the "lower segment" type. The mortality-rates were: maternal 11·6, fœtal 16·0 per cent. The report has been compiled for the second year in succession with great care by the registrar, Dr. J. N. Cruickshank, who remarks that the method of recording the cases has involved the omission of certain details. The reader would have liked more information, for instance, as to whether or not fœtal heart sounds were heard when the patient was admitted, especially in the series of "emergency breech extractions" where of 13 multiparæ admitted 8 children were stillborn and the remaining 5 died. The section of the report devoted to cardiac cases is of special interest and here the results obtained were excellent.

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[1] Quarterly Journal of Medicine, January, 1917.

[1] Surg., Gyn., and Obst., May, 1929, p. 687.

MINERAL WATER METABOLISM.

THE natural mineral waters of our own and Continental spas vary widely in their active constituents and recent investigation has perhaps tended to concentrate too much on the presence and possible effects of their radium, thorium, and actinium contents. Much work has been done in France and Germany on this basis and efforts have been made to show that the therapeutic action of these waters is similar to, if not identical with, that obtainable from pure solutions of these rare elements similarly used. The larger subject of the general pharmacology of these natural therapeutic agents, due in the main to their dissolved saline constituents, has thus been thrust somewhat into the background. The work of Dr. David Brown and Mr. A. Woodmansey, of which a digest appears in our present issue, is an attempt to remedy this omission. The fresh water from certain Continental and American springs has been shown to possess distinct and measurable catalytic properties which can be demonstrated in vitro. The Harrogate natural sulphur water has similar activities. R. McCarrison has shown the remarkable effect on rats of adding minute quantities of manganese to a diet deficient in certain essential accessory substances. Brown and Woodmansey have inquired whether this observation has a possible bearing on the mode of action of mineral waters. In their paper they attribute the general increase in tissue change, and the stimulation of special body ferments which they have observed, to the presence of manganese and its catalytic agency. Other measured effects are the retention in the body of large percentages of mineral constituents, notably sodium and barium, whose retention may be responsible in part for the metabolic changes observed. Knowledge must come slowly in a field in which the relation of cause and effect is so hard to assess; it is, however, work of this detailed and exact nature which is needed to increase our understanding of the mode or modes of action of these naturally occurring compound drugs and to give us a clue to their application in the treatment of disease.

INTRAVENOUS INJECTION OF ALCOHOL.

ALTHOUGH the method of anæsthesia devised by Dr. Miguel Garcia Marin, described on p. 1247, is not the novelty which it has been hailed as in various quarters, there are, nevertheless, details in it which are new and which may prove of value. Intravenous anæsthesia has, of course, been extensively practised with ether, with hedonal, and also, though less extensively, with ethyl alcohol. There are certain obvious advantages in this method, which are pointed out in the paper by Dr. J. D. Constantin, and there are counterbalancing disadvantages. These have hitherto outweighed the advantages to such an extent that intravenous anæsthesia has never established itself as a method of choice for routine work. It remains to be seen whether the improvements introduced by Dr. Marin will alter this state of affairs. The most important innovation is the use of isotonic glucose solution as the conveying medium for the anæsthetic. This may free the use of alcohol from one of the objections which largely led to its discontinuance—viz., the fear of damaging the red cells of the blood which are cremated by strong alcoholic solution. We notice the mention of hæmoglobinuria in Dr. Constantin's paper, which suggests that this danger is still not to be disregarded. A representative of THE LANCET was given the opportunity of seeing Dr. Marin's method employed and certainly as far as the two patients concerned are a test, the result was eminently satisfactory. But the operations were not a severe trial of anæsthesia. The induction of unconsciousness was quiet, but took longer than with most modern inhalation methods. The condition of respiration and circulation was excellent throughout and recovery was unattended by vomiting. One disadvantage of intravenous anæsthesia has always been the large amount of fluid added to the circulation which resulted sometimes in pulmonary œdema. We wonder whether a similar objection or others will arise to the instillation of large amounts of glucose solution. So far as the comparatively slender direct evidence now available goes, Dr. Marin's method appears to deserve further trial, which doubtless it will get from anæsthetists in this country.

THE ENEMIES OF RESEARCH.

MOST of us are inclined to treat the activities of the antivivisectionist with a certain detachment, for they do not interfere with the work of the ordinary practitioner. The research worker who has suffered directly from these attacks has no such philosophic attitude, and Prof. A. V. Hill seized the opportunity of his Stephen Paget Lecture to the Research Defence Society on June 10th to return a Roland for their Oliver, and to attack the whole spirit which informs opposition to man's painful progress. Too few, he said, realise fully the facts of man's gradual evolution; most people still think that Adam arrived full grown a few thousand years ago, with a complete university education and a degree in zoology. He drew a vivid picture of Nature's age-long experiment in living things by expressing them in the scale of a single lifetime. In that notation it had needed 49 years for man to learn to settle down in villages. Halfway through his fiftieth year he had learned to write; Christianity had been his religion since the middle of April of that year; printing had been invented a fortnight ago, steam less than a week, cars about a day, and wireless for a few hours. We are yet far from Utopia, said Prof. Hill, but the gradual progress of knowledge has improved men's lot and character and outlook in the last half-million years and may reasonably be expected to continue to improve them in the next 50 million. To the scientist, as to most reasonable men, that heritage of painfully acquired knowledge is a sacred thing. In Prof. Hill's words, "The capacity for knowledge, for understanding himself and his environment, is man's essential characteristic and his alone; to deny him the exercise of this fundamental gift would be an unpardonable, an almost unthinkable offence." To Prof. Hill antivivisection is "only a passing phase in the varying follies of mankind, while the fanatical desire to obstruct the advance of knowledge for one or other cause is a permanent factor in man's mental constitution, a mild form of mental disorder which has expressed itself from time to time in various hideous forms, in cruelty and persecution, in hatred and malice, in the perpetual treachery of hindering mankind in his slow and pathetic efforts to climb the ladder of civilisation. He instanced an "Anti-Rail-Road Journal" published in 1835, supported by the most worthy institutions and claiming to "fight only on the side of truth for the exposure of the railway system." Prof. Hill illustrated his lecture with a selection from a hundred letters he had received from antivivisectionists; most of them were incredible and many unprintable. "I know a gentleman living in Compton-street that has had two of his pussies stolen by your bloodhounds," ran one, and another: "From personal observation I have noticed that a vivisector becomes a seducer, an abortionist, and a potential murderer"; while a gentleman in E.12 wrote: "In my particular circle of friends we are doing all in our power to prevent any further subscription being sent to any hospital." On May 24th last the Parish Paper of St. Jude's-on-the-Hill, Hampstead Garden Suburb, contained an appeal from the Rev. B. G. Bourchier to intelligent people to take the opportunity of the general election to put an end to the waste of public money involved in medical research. "When," declared the lecturer, "by telling lies and spreading calumnies, by petty persecution in private or malicious persecution in the police-courts, by attempting to forward legislation forbidding the use of snails, lobsters, and frogs for research the antivivisectionist provides a wanton hindrance to the advance of knowledge, the matter ceases to be a joke, and if she tries to hinder the work of hospitals my blood begins to boil." He traced the desire to injure or kill those whose opinions differed from one's own through the Old Testament and the Middle Ages, instancing Galileo and other persecuted scientists. The Inquisition, at any rate, he observed, did not commit murder by proxy, but the antivaccinationists had declared that the death of Stephen Paget was a direct answer to their prayers. Prof. Hill put forward a vigorous defence of the work of hospitals and research departments and a plea for scientific tolerance combined with continuous scepticism of theory. His concluding words will be echoed by all who believe in evolution. "There are enemies of knowledge in all classes and categories and parties. We should be a great brotherhood unbroken by frontiers and national hatreds. If there is one thing in the world that should be international it is the pursuit of knowledge. . . . Individual freedom from molestation is the hard-won basis of modern civilisation; so it is with the advance of knowledge. . . . Modesty, friendliness, humanity, and a reasonable sense of humour are the basis of human welfare."

NEW POSTS IN THE LONDON PUBLIC HEALTH SERVICE.

OUR advertisement columns this week contain an announcement of no little importance. Under the new Local Government Act, the functions of the poor-law guardians of London and of the Metropolitan Asylums Board are to be transferred next April to the London County Council and over 80 hospitals and infirmaries, with a staff of some 16,000, will thus come under the Council's direct control. Obviously this will immensely increase the work of the public health department, and as a preliminary step the Council has decided to appoint three principal medical officers who will be responsible for coördinating the "transferred and existing health functions." The department will be reorganised into three divisions, and the new officials who are to preside over them will take precedence over the present senior medical officers and will receive a salary of £2000 a year, rising to £2500. These appointments will take effect from Oct. 1st, the question of medical staff of lower rank being deferred for later consideration. The transferred hospitals themselves employ 400 full-time medical officers, besides technical experts in various branches to the number of 150. The nursing staff is reckoned at not less than 7500 and the Counci proposes to appoint, also from Oct. 1st, a matron-in-chief on whom will fall, inter alia, the task of "reorganising the varied conditions which now obtain in the nursing services to be transferred."

INQUIRY INTO EPIDEMICS IN RESIDENTIAL SCHOOLS.

THE Medical Research Council, after consultation with the Ministry of Health and the Board of Education, have appointed a committee to inquire into the prevalence and mode of spread of minor epidemics in residential schools, especially those believed to to be spread by so-called droplet infection, and to report upon the means by which they may be prevented or restricted. The names of the committee are as follow: Sir George Newman (Chairman), Dame Janet Campbell, Dr. R. H. Crowley, Surgeon-Commander S. F. Dudley, Dr. J. A. Glover, Prof. M. Greenwood, F.R.S., Dr. L. R. Lempriere, Miss E. M. Newbold, M.A., Prof. W. W. C. Topley, and Mrs. Joyce Wilson, M.R.C.S. (Secretary).

THE CARBOHYDRATE CONTENT OF FOODS.

AS medical men we usually think of the carbohydrates as readily assimilated sugars or complexes of sugars each containing six carbon atoms. We are apt to forget that this group of foodstuffs also includes a large number of substances such as cellulose and complexes of the pentoses, or sugars with five carbon atoms, which, although broken down in the intestine with comparative difficulty, are of very considerable economic importance to the agriculturist on account of their nutritive value for herbivorous animals. In arranging diets both during health and in disease it is obviously more important to know how much carbohydrate is likely to be assimilated from a given quantity of food than to know the amount of carbohydrate actually measurable by chemical analysis. This is particularly desirable in the treatment of diabetes, and the physician is sometimes puzzled by the enormous differences in the figures given by different authorities for the amounts of carbohydrate in certain vegetables. Such discrepancies may arise from a lack of agreement as to the degree of utilisation by man of the less soluble carbohydrates. The Medical Research Council has just issued a report[1] bearing upon this subject which includes careful analyses of the carbohydrate contained in common British fruits and vegetables. The percentage of carbohydrate available for man is estimated from the hexose sugar, including that derived from starch, on the one hand, and the amount of the less valuable pentose derivatives on the other. The tables given in the first part of the report furnish a very valuable practical means of computing the available carbohydrate content of the diet of the diabetic patient. The broader question of the food values of vegetable carbohydrates forms the subject of the second part of the report. The authors confine themselves deliberately to a discussion of the fate after ingestion of those carbohydrates which are not included in the ordinary starches and sugars which form the main source of energy for the metabolism of man—namely, cellulose, pentosans, and the condensation products of lævulose, of which the inulin of artichokes is the best-known member. The mammalian organism does not possess specific enzymes for breaking down these products, so that even herbivorous animals, which may derive a considerable portion of their energy from such substances, have to rely on bacterial decomposition in the intestine to make them available for absorption. It has been found that man can utilise small amounts of cellulose or of the pentose complexes as efficiently as herbivorous animals, although his alimentary canal is not adapted for dealing with large quantities, so that in practice even a vegetarian does not derive any appreciable quantity of energy from this source. During the late war the scarcity of food led to serious attempts in Germany to determine whether such cellulose-containing substances as straw and wood could not be made available for human nutrition. The difficulties lay partly in the unpleasant bitter taste which the addition of these substances to flour produced and partly in the diarrhœa which they so frequently provoked, which naturally led to a greater loss of available food than the amount gained by the additions. The laxative effect of cellulose and similar substances is frequently made use of in clinical medicine. McCance and Lawrence point out that this effect is not due directly to the bulk of their indigestible residues, but rather to the stimulation and irritation of the intestinal glands which they produce and which lead to an increase in cell detritus and in the products of glandular activity which results in a considerable increase in the bulk of the fæces. The food value of vegetable carbohydrates has an obvious bearing on the question of the relative merits of white and wholemeal bread. As a source of energy they say there is no doubt that weight for weight white bread is better than wholemeal bread. It has been found that on a mixed diet including white bread 8 per cent. of the energy value of the food was lost in the fæces, while with wholemeal bread the amount lost was 14 per cent. The vitamin B contained in wholemeal can be supplied in other ways and any laxative effect produced by the indigestible carbohydrate residue can be secured equally well by the consumption of other vegetable products, so that the authors of this report see no reason at present for any universal advocacy of wholemeal bread.

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[1] The Carbohydrate Value of Foods. By R. A. McCance and R. D. Lawrence. Med. Res. Counc., Spec. Report Ser. No. 135. H.M. Stationery Office. Pp. 73. 2s.

WE are happy to be able to announce that the King's convalescence is making progress. The collection of pus which formed under the site of the old scar has now drained and the abscess is nearly healed. X rays show the existence of one or two minute sequestra, but there is good prospect of the condition clearing up without further interference.

Sir William Thompson, whose death occurred last Sunday at Dublin in his sixty-ninth year, had not long retired from the position of Registrar-General for Ireland.

IN the annotation on the Birthday Honours in our last issue it should have been stated that Dr. H. K. Graham Hodgson, honorary radiologist to King's College Hospital, receives a C.V.O. in recognition of his services during the King's illness.

Mr. T. Franklin Sibly, D.Sc., has accepted the post of Vice-Chancellor of the University of Reading. The severance of his connexion with the University of London, where his short term of office as Principal has entailed heavy responsibilities during a period of reorganisation, will be widely regretted. The good wishes of the many friends he has made in London will follow him to his new work.

Mr. Arthur Greenwood, the Minister of Health in the new Government, was a student of Victoria University who became head of the Economics Department of Huddersfield Technical College and lectured on Economics in the University of Leeds. He was Assistant Secretary of the Ministry of Reconstruction in 1917–19 and Parliamentary Secretary to the Ministry of Health during the last Labour Parliament. He has been a close student of the health and physique of school-children to which he has made some personal contribution. Miss Susan Lawrence, M.P., has been appointed Parliamentary Secretary to the Ministry of Health.

Dr. Christopher Addison has been appointed Parliamentary Secretary to the Ministry of Agriculture and Dr. Drummond Shiels Parliamentary Under Secretary to the India Office.

Mr. F. G. H. Holt has been appointed Secretary and Manager of THE LANCET in succession to the late Mr. R. E. Sare.

DONATIONS AND BEQUESTS.—Mr. Richard Berriman Chellew, of Tremorvah, Truro, Cornwall, shipowner, left £1000 each to the Royal Cornwall Infirmary, and St. Dunstan's Hostel for Blinded Sailors and Soldiers.—Mr. Lawrence Matthew, of Elmsholme, Grange-road, Ealing, left £500 each to King Edward's Memorial Hospital, Ealing, and to the Hostel of St. Luke's, Fitzroy-square, W.—Miss Maria Margaretta Horrocks, of Ribblesdale, Preston, left £500 to the Preston and the County of Lancashire Queen Victoria Royal Infirmary, and £300 each to the Preston Industrial Institution for Blind Children, the Harris Orphanage, Fulwood, and the Royal Cross School for Deaf and Dumb Children.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCXCIV.—TREATMENT OF EMPYEMA.

THE principles which should guide the treatment of empyema will be discussed under two headings: (1) Tuberculous, and (2) Non-tuberculous cases.

Tuberculous Empyema.

This condition may arise as a late result of pleural effusion but is more frequently found as a complication of artificial or spontaneous pneumothorax, and strictly should be called pyopneumothorax.

When a clear effusion develops in the course of artificial pneumothorax treatment the prognosis does not become more serious, but if that effusion is purulent the outlook at once becomes very grave. Except in a few cases of ruptured lung the condition is due to the tubercle bacillus alone and not to a mixed infection, for not only is the pus characteristic in appearance, but no other organism except the tubercle bacillus is found. As soon as tuberculous pus has developed in the pleural cavity the following principles of treatment should be adopted:—

1. Remove the pus by aspiration and not by open drainage.
2. Encourage the lung to expand in order to obliterate the pneumothorax or empyema cavity.
3. Should the lung fail to re-expand, some thoracoplastic operation should be performed to obliterate the cavity.
4. Attend to the general condition of the patient.

In order to cleanse the cavity and assist the lung to re-expand it is best to wash it out with a 1 in 5000 solution of methylene-blue or with Dakin's solution. I use two needles for this purpose; through the upper one oxygen is introduced in a steady stream while the pus flows evenly out of the lower needle. By this means the intrapleural pressure is kept even throughout the procedure. When as much pus as possible has been removed, methylene-blue or Dakin's solution is introduced through the upper needle and the pleural cavity gently washed out. The lower needle is then removed and the intrapleural pressure is taken by a manometer connected with the upper needle. The pressure is left at about −6 cm. water. By these means the lung will re-expand in a certain number of cases, although the aspiration may have to be repeated. If there is a perforation in the visceral pleura it may be difficult to wash out the cavity, and Dakin's solution should not be used. In such cases, after removing the pus, oil of gomenol has been introduced, but in my experience this has not proved helpful, although good results in a few cases have been described by other writers.

If the lung fails to re-expand, the pleural space should be closed by thoracoplasty, since the mortality in those cases which are left alone is very high. It is important to see that the patient's condition is as good as possible before operation, and therefore he should be given a period of treatment in the fresh air with a generous diet, including plenty of glucose. A preliminary operation for phrenic evulsion is advisable and the subsequent thoracoplasty is usually performed in two stages, although some surgeons prefer to complete it at one operation.

Non-tuberculous Empyema.

In these cases treatment depends largely on whether the pus is free in the pleural cavity, or whether it is in a local pocket cut off from the general pleural cavity by adherent pleura. If it is free in the pleural cavity, the condition is really one of pyothorax, and any operation for open drainage will convert it into an open pyopneumothorax, and in this condition the mortality is very high indeed.

When an open wound is made into the pleural cavity on one side the pressure is affected practically to the same degree on the other side, provided there are no adhesions and the mediastinum is free. Consequently, during inspiration much of the air that should enter the lungs through the trachea enters the pleural cavity through the open wound. In addition to this many of these cases have a pneumonic condition, so that the lungs are already getting insufficient air and an open pneumothorax results in a fatal dyspnœa.

The great principle of treatment should therefore be to avoid an open pneumothorax. This may be done by inserting a drainage-tube with a valve so that no air can enter the pleural cavity, but pus can leave—in other words, a negative drainage system is established. The tube may slip out, however, and treatment by repeated aspiration in this stage is perhaps better.

In some cases the condition may be cured by aspiration alone, but usually the liquid, which is at first cloudy, becomes more and more purulent and drainage later becomes necessary. As a result of the aspiration, however, the lung partially re-expands and adhesions form to the chest wall. Moreover, time is given for the acute pneumonic process to subside, so that the patient is in a better condition to stand an operation.

In practice it is found that in a case of pneumococcal lobar pneumonia the empyema forms after the patient has recovered from the pneumonia, and there are so many adhesions that the empyema is shut off from the main pleural cavity, and consequently open drainage often gives excellent results. The pus is usually very thick and drainage is necessary.

In cases of streptococcal pneumonia, however, especially in those very acute forms which follow influenza, a cloudy serous effusion forms early in the disease whilst the patient is still thoroughly toxic and before adhesions have had time to form. It is in these cases that early operation and open drainage give such disastrous results.

W. J. Stone[1] has published the results of three series of cases:—

(*a*) Eighty-five cases treated by early operation and drainage had a mortality of 61·2 per cent.

(*b*) Ninety-six cases treated by early aspiration and late operation had a mortality of 15·6 per cent.

(*c*) Ninety-four cases treated by early aspiration and late operation with a mortality of 9·5 per cent.

The importance of avoiding an open pneumothorax is clear, and for practical purposes it may be assumed that when the effusion has developed into frank pus adhesions will have formed, and operation is safe.

Re-expansion.

Another important principle in treating empyema is to encourage the lung to re-expand in order to obliterate the empyema cavity. If this is not done subsequent thoracoplastic operations may be necessary in order to deal with a chronic empyema. The re-expansion of the lung is prevented largely by the fibrinous exudate which forms and organises over the visceral pleura, and by the air which enters through the operation wound. To remove the fibrinous membrane from the lung—in other words, to decorticate the lung—the empyema cavity should frequently be irrigated with Dakin's solution. Not only will this remove the membrane, but it will also tend to sterilise the empyema cavity and so prevent the pus from re-forming. The practice of washing out the cavity after operation is a very important one, and if carried out carefully will prevent many of the late complications of empyema.

It is also important to attend to the general condition of the patient. As a rule, the appetite returns when the acute toxic effects of the pneumonia have passed off, so that it is possible to give a nourishing diet before operating; this increased appetite is probably another factor in lowering the mortality when preliminary aspiration, rather than early operation, is adopted.

It is, of course, possible to operate too late as well as too early. On general principles it may be considered safe to operate when the effusion has developed into frank thick pus and when the patient has got over the initial toxæmia of the pneumonia. The bad results of early operation are due to the absence of adhesions with a freely movable mediastinum and to the toxic condition of the patient.

Conclusion.

To sum up, the following principles should be observed in the treatment of empyema:—

1. Remove the pus, but always avoid an open pneumothorax.
2. Encourage the lung to re-expand and obliterate the empyema cavity. In order to do this the cavity should be irrigated with Dakin's solution, and any drainage of a large cavity should be arranged as far as possible so that air cannot enter from outside.
3. Sterilise the cavity by frequent irrigations with Dakin's solution.
4. Attend to the general condition and nourishment of the patient.

L. S. T. BURRELL, M.D., F.R.C.P.,
Physician, Royal Free Hospital and Hospital for Diseases of the Chest, Brompton.

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[1] Amer. Jour. Med. Sci., 1919, clviii., 1.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1928 statistics of three boroughs:

Name of borough and estimated (R.-G.) population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Hove .. .. (50,497)	9·5	15·2*	0·83	2·57	1·7	2·8	73/31†	21	8·3
Margate .. .. (29,260)	12·6	10·9	0·78	1·98	0·75	2·3	38/—	—	0·0
Stafford .. .. (28,740)	15·1	10·2*	1·03	1·31	1·5	1·9	60/34	23	4·6

* The standardised rate was: for Hove 11·2 and for Stafford 10·1.
† Infant deaths in the first week of life only.

Hove.

Dr. Augustine Griffith says the chief event of the year was the extension of the borough, increasing its area from 1594 to 4010 acres. The county council has delegated its powers under the Nursing Homes Act and 30 homes have been registered, 3 for maternity cases, 8 for maternity and other, 3 for invalids, and 16 for medical and surgical cases. No applications were refused. An epidemic of measles, with many severe cases and 10 deaths, raised the question of the inadequacy of the hospital to provide for this disease. There were 97 admissions for scarlet fever, which caused no deaths in the borough, to 10 for measles. The council completed 86 houses during the year, bringing the total of municipal houses up to 521. There are 46 more in course of erection and tenders accepted for another 50. There are still some families "living under bad conditions." The council contribute towards the cost of the Portslade child welfare centre which is used by the mothers of their housing estate.

An agreement has been made with the guardians for the admission of puerperal pyrexia cases to the Steyning Union Infirmary. Licences were granted to six vendors for "Certified" and to eight for "Grade A" milk. One of the sanitary inspectors was sent for a week's course of instruction at Wye Agricultural College. Two prosecutions for milk, deficient in fat 15 per cent. and 13·3 per cent. respectively, failed because the bench decided the milk was "as it came from the cows." A small outbreak of milk-borne scarlet fever was attributed to a dairy employee, who had tonsillitis for 24 hours before giving up work and consulting his doctor.

Margate.

Dr. Rowan McCombe points out that the population during the height of the season exceeds 100,000 and that this has an important bearing on the demand for water. Thus while the daily average pumped (from the chalk) during 1928 was just over 2 million gallons, the maximum quantity pumped in one day was 3,375,000 gallons. Broadstairs takes supplementary water (the maximum in one day in 1928 was 500,000 gallons) from Margate and 28 outside parishes also depend upon this supply. A scheme has been sanctioned for a new "mass concrete" reservoir with a capacity of 2,000,000 gallons at a cost of £20,000 and a large expenditure in land purchase to protect the purity of the water will shortly be necessary. A further expenditure of £100,000 on new mains is expected to make provision for the demands of the next 30 years. During 1928 £17,200 was spent in laying an iron pipe to convey the sewage of the colliery village of Aylesham, a distance of four miles to new disposal works situated about one and a half miles north of the water-pumping station. The sewage of Margate is effectually screened before being discharged into the sea, and as it is only discharged 600 yards from the cliffs at high water "when the tide is racing out to the North Sea," it is claimed that "it is physically impossible for any sewage to find its way to the foreshore" and that the Margate sewer outfall works, designed by the borough surveyor, Mr. E. A. Borg, are as near perfection as possible.

Hitherto Margate has only had a cottage hospital with 40 beds, chiefly for accidents and surgical cases. It is expected that the new hospital with accommodation for 60 patients will be completed next year. The Kent County Council have delegated their powers under the Nursing Homes Act, which came into force on July 1st, to Margate. Twelve applications for registration received were all granted. Two of the four practising midwives are municipal and the fees which they earn are paid into the borough fund. They spend their spare time in antenatal visiting and Dr. McCombe considers the benefit to the poor people from their services, at a very small cost to the ratepayers, "almost incalculable."

Since 1920 the corporation have, by erecting 356 houses, alleviated the housing problem to a certain extent, but there are still applicants for houses, living in sub-let rooms. No subsidy houses were erected during 1928. A similar deficiency in milk fat (viz., 14 per cent.) to those which led to unsuccessful proceedings in Hove resulted in a fine of £5 for a Margate vendor. Some of the 14 private slaughter-houses are of obsolete construction and too close to dwellings. The only alternative is considered to be a public abattoir and the question of its provision has been deferred for a year. Six vendors have licences for "Certified" milk, four for "Grade A (T.T.)" and two for "pasteurised." One outside farmer was removed from the register owing to the unsatisfactory way in which the milk was handled on his premises. The hours of bright sunshine registered were 1983·7 and the rainfall was 24·25 inches.

Stafford.

Dr. J. T. Macnab describes a small outbreak of mild small-pox at the end of the year. The original case occurred in an institution and was mistaken for chicken-pox. The last of the seven cases was diagnosed on Dec. 31st. The outbreak drew attention to the need for a shelter for the occupants of houses needing thorough disinfection. During the last nine years the corporation have built 604 and private enterprise 337 houses. There are still 136 houses to be completed on Stone Road Estate and when they are finished it is proposed to pause to see what private enterprise will do. Dr. Macnab doubts if houses at suitable rents will be forthcoming from this source. Forty houses on the corporation estate have been earmarked for necessitous applicants and when complete will bring relief to the poorer families. They have three bedrooms and are to be let at 9*s.* per week inclusive of rates.

Dr. Macnab is anxious to have the Octavia Hill system tried. Under such a system the new tenants would be selected and grouped according to their existing home conditions; they would be encouraged to respond to the better environment by the woman manager maintaining close touch with the housewife; they would be given a better house when they had made good; and, furthermore, coöperative schemes for the purchase of lawn-mowers and garden implements and other schemes to foster the interest of the tenants in the estate would be organised.

The Coöperative Society are providing two large modern abattoirs. The provision of a third similar one would supply the needs of the town, enable 13 unsatisfactory slaughter-houses to be closed, and make thorough meat inspection practicable. Another need is the installation of filtration plant at the swimming baths, so that every day may be clean water day instead of only two in the week. The new reinforced concrete service reservoir, capacity one million gallons, came into constant use in June.

The Isolation Hospital, with 22 beds, has to serve a population of 38,000 in the borough and the rural district, and its admissions were practically limited to scarlet fever and diphtheria during 1928. There were 82 notifications of diphtheria in the borough and two deaths, "both of which could have been avoided if medical aid had been called in sooner." Dr. Macnab also draws attention to the danger of delaying the use of antitoxin till the bacteriological report comes in and to the entirely inadequate doses sometimes employed. During the summer many of the cases were associated with a particular engineering works. The manager gave every facility in the tracing of carriers and in stopping the use of common towels, drinking cups, &c. The spread of cases ceased with the discovery of the chief carrier.

Antenatal consultations are held once a week and the need for them is shown, says Dr. Macnab, by the occurrence of 15 neonatal deaths and 21 stillbirths (equivalent to 4·8 per cent. of the total live births). Fourteen of the stillbirths were investigated. The only mother who attended the antenatal centre was sent to her own doctor for hydramnios, which proved to be associated with an anencephalic fœtus. During the last three years the deaths from 1 to 5 years have averaged only 13, while for the years 1914 to 1916 the annual average number was 24, suggesting that infant welfare work also reduces the mortality in subsequent years. Of 406 children who completed the age of 9 months during 1928—

86 per cent. were breast fed at the first visit:
67 „ at the end of three months; and
55 „ were breast fed for over six months; while
14 „ were artificially fed at the first visit.

Efforts of the health visitors to encourage breast-feeding are still handicapped by unwise advice given to the mother "that her milk does not suit the baby." Stafford has no municipal maternity home and a maternity annexe to the infirmary would fill a great want.

MENTAL HOSPITAL REPORTS.

THERE were 655 patients on the books of the *City of London Mental Hospital* at Stone, Dartford, at the end of last year, and applications for admission continued to be numerous. In fact, more private patients wanted to come in than could be accommodated. Seventy-five of the 176 patients admitted were uncertified. The recovery-rate was 62 per cent. of direct certified admissions and 41 per cent. of voluntary cases. The death-rate was 3·2 per cent., and there was no serious illness or epidemic disease. The operating theatre, dental surgery, X ray room, ultra-violet light installation, and laboratory have all played their part in helping to bring about this satisfactory result. A new fire alarm system has been installed and the heating system has been remodelled. The male hospital ward has been supplied with a clinical room and the female infirmary section with a verandah. The visiting Commissioner remarks on the general comfort and amenities of the institution, observing that "it would indeed be difficult to find any modern refinement of technical practice or procedure of proved value which is not represented here." Four nurses obtained their M.P.A. certificate during the year.

The *Plymouth Mental Hospital* report for the year ending March 31st, 1929, has an air view of the institution as frontispiece. At the end of 1928 there were 525 patients on the register; the annual admission figure was much lower than that of the year before. The death-rate was 5·13 per cent., in spite of nine deaths from general paralysis and three from tuberculosis. The medical superintendent points out, however, that this low rate cannot be maintained, as 10 per cent. of the hospital population is over 70 years of age and the next influenza epidemic is bound to take a heavy toll of these feeble senile patients. The recovery-rate was 38·2 per cent. The building is overcrowded and treatment is hampered thereby. An extension scheme is to be initiated by building a nurses' home, which will free some sleeping space on the female side but will not help the problem of day space. The whole building has been re-wired and a new tennis-court has been laid down. The dental surgeon visited regularly during the year, and the ophthalmic and surgical consultants rendered services when required. One male and two female wards are "open-door" and 30 patients of each sex have had parole beyond the estate. Another 65 are free within the grounds. Excursions to the seaside and moors are conducted. A clinic for early mental and nervous cases is to be started at the South Devon and East Cornwall Hospital. One attendant and two nurses passed the final examination of the R.M.P.A.

The report of the *Cheshire County Mental Hospital* at Parkside for the year ending March 31st, 1929, is illustrated with two photographs of the ultra-violet light installation and includes an extract from Dr. Dove Cormac's paper on this form of treatment (see THE LANCET, 1929, i, 142). More than 50 patients were treated with benefit during the year. On the last day of 1928 there were 1301 patients on the books of the institution; this is 22 more men and 11 less women than the normal accommodation provides for. A joint meeting of the Upton and Parkside committees decided that this was not an opportune moment for building, but that the urgent need for further accommodation should be met by trying to obtain beds for chronic and senile cases in the workhouses. The admission-rate during 1929 was quite 20 per cent. below the average. Of the 190 cases admitted 97 offered little hope of cure. The recovery-rate was 33·6 per cent. and the death-rate 5·46 per cent. Heart disease was the cause of death in 25 cases, lobar pneumonia in 10, and general paralysis and cancer in 5 each. Five cases of general paralysis were treated by induced malaria, with satisfactory results. There were ten cases of typhoid fever, recurring from the epidemic two years ago, and an epidemic of influenza in the spring. Five men and two women are suffering from tuberculosis. Sixty-two women were occupied in various forms of handicraft, and 22 men in brush and toy making, upholstery and cocoanut-fibre matting work, and the products of the occupation therapy department found ready sale. The occupation officer also controls a recreation department where the patients are taught games and country dancing. Two male and four female wards are administered on the open-door principle, and parole was granted to 100 patients outside and nearly as many more inside the estate. A number of verandahs have been added to the wards. A total of 1825 pathological investigations were carried out in the laboratory, the majority being routine examinations of urine. Thyroid was tried on 11 patients suffering from dementia præcox, but the benefits observed were only temporary. The superiority of hot cocoa over hypnotics has been confirmed. As in the past, monthly meetings for the local medical profession were held at the hospital and were well attended. Fourteen female and four male probationers obtained the final certificate of the R.M.P.A.

PRIVATE MENTAL HOSPITALS.

The Cassel Hospital.

The report of the Cassel Hospital for Functional Nervous Disorders for 1928 provides as usual much valuable information drawn from first-hand experience in the treatment of minor mental ailments. This report contains the tables which have been omitted from the last two, giving the results of the treatment of each patient in full detail. Besides the individual case-histories, which make very instructive reading, Dr. T. A. Ross writes at some length on his experience of focal sepsis and schizophrenia. The number of patients who have been relieved by operations for sepsis, after other methods have failed, is small. Dr. Ross points out an important fallacy which in most cases falsifies the conclusion that benefit has been derived from operation. The majority of the patients were relieved of their symptoms by methods which were certainly psychological. All patients received physical treatment such as rest, exercise, fresh air, and good food, but many who had been receiving these things for a long time before they went to Swaylands responded favourably to the fresh ideas which they encountered. Moreover, an operation has in itself a strong psychological element, which varies considerably with the enthusiasm of the person who recommends it. Before any cure is directly attributed to an operation for focal sepsis, it must be ascertained beyond doubt that the infection had a direct causal connexion with the disorder, and that it was not merely an excuse for the neurosis. Many patients undergo operations for focal infection, undertaken after careful investigation, and derive no benefit. The operations, moreover, carry a certain amount of risk to life. Dr. Ross mentions one indication for operation which he has not found in the literature—that is, when a patient has an organic disease to which he falsely attributes his symptoms. An operation performed under this indication must, of course, not be a serious one, but may be useful in driving the patient out of this entrenched position into the open, where he may become amenable to analytical treatment. For instance, a patient came to Swaylands in the full belief that he had tabes. He would not discuss his psychology, as he held that it was irrelevant. After some weeks he began to accept the continued daily proof that, whatever he had, it was not tabes. He then complained of lumbago, until it was proved that he had not got it; then he fell back on a chronic nasal discharge, which he said was poisoning him. He was most unwilling to go to the rhinologist and equally unwilling to have a deviated septum straightened, but as he was committed to the position that his mental symptoms could only be due to a physical disease, and as this was the only one he had left, he could not back out. Since his original symptoms persisted after this last stronghold had been reduced, he decided to give the psychological view a hearing, and has begun to improve. This patient illustrates, according to Dr. Ross, the interesting point that patients who put forward a theory of disease do not wish it to be taken too seriously. Dr. Ross quotes an observation made by a medical student of considerable intelligence, who was a patient last year. "The neurotic is apt to choose diseases, aches and pains, which he is fairly convinced have no serious significance; but let a doctor tell him he is suffering from a disease, and he will be seriously disturbed."

Dr. Ross's experience has shown him that schizophrenic states, even though they may recur after disappearance, do not necessarily lead to dementia. Some patients, with clearly marked schizophrenic symptoms, have become well without any special method of treatment. They are treated with particular care and given a special nurse, on whom it is constantly impressed that they are very sick people. The difficulty is that it is practically impossible to keep them without a special nurse, and many have to be sent away. They must not be left alone for very long, and association with them is bad for the psycho-neurotic patients. The general atmosphere of Swaylands is, Dr. Ross thinks, well suited to them, and he has proposed to his committee the experiment of providing a few special nurses, and keeping a few cases for a couple of years. Unfortunately, their recovery is usually slow. Dr. Ross gives his usual interesting figures, obtained by following up discharged patients, and discusses some illustrative cases of psychological maladaptation.

The Lawn, Lincoln.

A hundred years ago one *Paul Parnell*, a surgeon of Lincoln, left a legacy of £100 towards the provision of a private refuge for the mentally afflicted. From this benefaction arose the hospital for mental and nervous disease, known as The Lawn, Lincoln, of which the centenary will be celebrated in November of this year. The first physician to the hospital was *Dr. E. P. Charlesworth*, to whose disinterested and persevering benevolence a statue in the grounds bears witness. Under his rule and that of his successor, Dr. Gardner Hill, The Lawn gradually became a home of compassionate and enlightened care. It is a registered hospital, where educated persons of limited means can be treated either as voluntary boarders or as certified patients. Many changes in personnel are recorded this year, including the medical superintendent, the matron, some senior members of the nursing staff, and the secretary. It is interesting to note that Dr. Mary Barkas, who has been made medical superintendent, is the third woman to hold this post, the first, Dr. Lillian Cunard-Cummins, having been appointed in 1898. The new matron and sisters appointed are qualified in mental as well as in general nursing, and the hospital has been recognised as a training school for female nurses. Certain structural alterations have been made, including the adaptation of an admission ward for mild and borderline cases and for convalescent patients; a verandah roofed with glass permeable to ultra-violet light has been added. Dr. Barkas reports that the total number of patients and voluntary boarders under treatment during the year was 107, the average number resident being 69; 16 patients and 19 voluntary boarders were admitted during the year. The recovery-rate, calculated as a percentage of the year's admissions, was 66·6. The recovery-rate of voluntary boarders was low in comparison with that of the certified cases, partly because they are apt to leave before mental health is properly re-established and partly because the type of case which recovers quickly and completely is incapable of exercising volition. The general health was good throughout the year. A number of patients go into the town and country regularly on parole, with friends or with nurses in mufti. Rug-making has been taken up with ardour and the medical superintendent hopes to extend occupational therapy. The appointment of a specialist in domestic economy to supervise household matters has proved a great success. Dr. Barkas, giving her "first impressions," points out that in a small hospital with limited financial resources there cannot be any great outlay on laboratories, pathological research, and elaborate treatment apparatus; it must concentrate on mental illness and treatment. She holds that treatment of maladjustments by psychotherapy in its widest sense constitutes the primary task of the psychiatrist.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 1ST, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 242 (last week 298), scarlet fever, 1704; diphtheria, 926; enteric fever, 41; pneumonia, 1267; puerperal fever, 48; puerperal pyrexia, 109; cerebrospinal fever, 17; *acute poliomyelitis*, 3; *acute polio-encephalitis*, 2, encephalitis lethargica, 25; dysentery, 9; ophthalmia neonatorum, 115. No case of cholera, plague, or typhus fever was notified during the week.

The largest incidence of small-pox at the moment is in London (Bethnal Green, 12; Poplar, 7; Stepney, 11); Chesterfield R.D., 10; South Shields, 11; West Ham, 29; Leigh (Lancs.), 6; Northampton, 8; Peterborough, 16; Stoke-on-Trent, 15; Spenborough (Yorks.), 8; Pontefract R.D., 13; and Merthyr Tydfil, 5.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on June 4th–5th was as follows:—Small-pox, 286 under treatment, 16 under observation (last week 307 and 10 respectively); scarlet fever, 1352; diphtheria, 1547; enteric fever, 14; measles, 136; *whooping-cough*, 651; puerperal fever, 27 (plus 8 babies); encephalitis lethargica, 116; poliomyelitis, 1; "other diseases," 63. At St. Margaret's Hospital there were 17 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 2 (0) from enteric fever, 55 (0) from measles, 5 (2) from scarlet fever, 51 (15) from whooping-cough, 17 (2) from diphtheria, 43 (7) from diarrhœa and enteritis under two years, and 47 (7) from influenza. The figures in parentheses are those for London itself.

For the first time over a period of ten weeks no death from small-pox is reported from the great towns. Liverpool reported 18 deaths from measles, Leeds 7, Salford and Sunderland 6 each. Liverpool also stood highest with 4 deaths from whooping-cough. Diarrhœa accounted for 6 deaths in Birmingham. Manchester reported 4 deaths from influenza.

The number of stillbirths reported during the week was 205 (corresponding to a rate of 39 per 1000 births), including 46 in London.

DEATHS FROM SMALL-POX.

FOUR cases of small-pox occurring recently in Gravesend have ended fatally. We are indebted to Dr. C. D. Outred, medical officer of health, for the following details.

CASE 1.—Female, aged 16, a daily domestic. Onset April 5th, rash appeared on the 7th, notified and removed to Gravesend Isolation Hospital on the 10th, died on the 18th. Disease severe, Eastern type. Unvaccinated.

CASE 3.—Female, aged 24, house duties. Onset April 19th, rash appeared on the 20th, died on the 21st at home before being seen by a medical practitioner. Disease severe, Eastern type. Unvaccinated. Source of infection unknown.

CASE 6.—Female, aged 25, house duties, sister of the previous case and living at the same address. Onset April 19th, rash appeared on the 20th, notified and removed to hospital on the 22nd, died on the 25th. Disease severe, Eastern type. Unvaccinated.

CASE 7.—Male, aged 64, labourer unemployed, living in the same street as Cases 3 and 5. Onset May 4th, rash appeared the same day, notified and removed to hospital on the 5th, died on the 8th. Disease severe. Unvaccinated.

The total number of cases notified was seven, of which four were of a severe type and died; all four were unvaccinated. Of the three mild cases, one was vaccinated at about the time of infection and was only slightly affected.

by the disease. Of the other two, one (No. 4, aged 46) had been vaccinated in infancy. Four houses were affected, but no connexion with the different families was established except in the case of No. 7, who was a direct contact. Two cases were removed from one house (No. 1 sister, and No. 6 brother). Three cases were notified from 10, Bentley-street, and one case from each of two other houses.

The fatal case at Caerphilly (the only death among 76 notified cases) was that of a woman, aged 56, who was notified on April 3rd. When seen by Dr. T. W. Thomas, medical officer of health, on the following day, she had a temperature of 104° F. and was comatose, with incontinence of urine and fæces. Later she had hæmorrhage from the bowels. The rash was very scanty. This woman had been vaccinated in infancy and showed two small marks. She declined to be revaccinated when her son aged 16, living at the same address, was certified to be suffering from small-pox, and removed to hospital on March 18th. On April 4th she was too ill to be removed and she died on the 8th. The death certificate was filled in: Encephalitis; small-pox. No P.M.

Special Articles.

MILK CONSUMPTION AND THE GROWTH OF SCHOOL-CHILDREN.

A TEST IN A RURAL DISTRICT.

By M. L. CLARK, L.L.A.,
ROWETT RESEARCH INSTITUTE.

THE extensive tests on the value of milk for school-children carried out over a period of two years in Scotland and Northern Ireland[1] by the Rowett Research Institute, Aberdeen, and the Scottish Board of Health showed that the addition of milk to the diet of children in the larger towns was followed by an increased rate of growth and general physical improvement.

In these tests no observations were made on children attending rural schools. It was suggested that a small test on similar lines might be arranged in a purely agricultural district and an offer of a donation to cover part of the cost was received. A test was therefore done in two small rural schools in an English agricultural county. The numbers of the children at the schools—10 in the control and 19 in the milk school attending during the seven-month period—are, of course, far too small to allow of any conclusions being drawn or to warrant any statistical analysis The details which are given below are of value only inasmuch as they show that in two rural schools chosen at random much the same results were obtained as in the large-scale tests in the towns. The only definite conclusion that might be drawn is that we are not warranted in assuming that even in agricultural districts children receive the optimum amount of milk. It would be of great interest to ascertain whether this small sample is typical of the whole agricultural area.

It would be valueless to give all the data in detail. The main results are as follows.

1. *Amount of Milk Consumed at Home.*

Rural (1929)	3½	pints per person per week.
Scotland (1927)	2½	

Even the amount shown in the rural inquiry is only one-third of that which is considered to be the optimum for the growing child (Sherman).

2. *Effect on Growth of Addition of Three-quarters to One Pint of Milk, According to Age.*

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	Average increase in Height.	Average increase in Weight.
l (1929)	1·402 in.	4·304 lb.
ol (1929)	1·125 in.	4·000 lb.
	+0·277 in.	+0·304 lb.

The height increases correspond closely with those of the large-scale tests which were as follows:—

	Average increase in Height.	Average increase in Weight.
Milk groups (1927)	1·470 in.	3·617 lb.
Non-milk groups (1927)	1·212 in.	2·974 lb.
	+0·258 in.	+0·643 lb.
Milk groups (1928)	1·459 in.	3·578 lb.
Non-milk groups (1928)	1·181 in.	2·461 lb.
	+0·278 in.	+1·117 lb.

3. *Effect of Addition of Milk on General Condition.*—A distinct increase in liveliness and general alertness as well as a physical improvement was noted by the teacher of the children receiving milk. The attendance during the feeding period (October, 1928, to May, 1929) averaged 97·1 per cent. in the milk school, while the control school only reached 84·1 per cent. The average attendance during the six months October, 1928, to April, 1929, for the district containing the two schools was 85·8 per cent. and for the whole county 86·8 per cent., which shows that the control school had not suffered disproportionately from illness. Comparing the amount of time lost by the children, the average in the milk group was 3½ days per child in the seven months, in the control group 19½ days.

We know that during the last decade a great improvement has taken place in the health of the school child in towns. This glimpse of a small rural community would suggest the probability that the children in such districts may also require further aid to assist them to attain to better physical condition and growth.

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r, Jan. 28th, 1928, and Jan. 5th, 1929.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Irish Medical Men in England.

CERTAIN statements attributed to Dr. Alfred Cox, Medical Secretary of the British Medical Association, in a London paper last week have given rise to discussion in medical circles in Dublin. In Dr. Cox's view, there is an over-production of doctors in Ireland, which tends to unbalance the medical labour market in England. It is suggested that only some 10 per cent. of medical men educated in the Irish Free State are absorbed by practice in that country. This is a startling under-statement of the fact. An examination of the Medical Register shows that approximately 40 per cent. of those who obtain their medical qualifications in the Irish Free State remain there. For the whole of Ireland the figure would be about 50. Dr. Denis Coffey, President of University College, Dublin, in an interview given to the press, points out that England has always relied on Scotland and Ireland to keep up a supply of medical practitioners, only about 50 per cent. of the medical men practising in England having received their qualifications there. The proportions at present are said to be approximately: English qualifications, 48–50 per cent.; Scottish, 32 per cent.; Ireland, 14 per cent.; colonial and foreign, 5½ per cent. If there is any unbalancing of the English labour market it seems to come from Scotland rather than from Ireland. Moreover, the number of those qualifying in Ireland has not increased appreciably in recent years, and is, of course, much less than it was six or seven years ago. The undoubted success of both Scottish and Irish medical men in practice in England serves to show that their services are both required and appreciated there.

Honorary Fellowship for Dr. Denis Coffey.

At the last meeting of the Royal College of Physicians of Ireland, Dr. D. J. Coffey was unanimously elected an Honorary Fellow of the College. Dr. Coffey is President of University College, Dublin, and also President of the Irish Free State Medical Registration Council, and his election may be regarded as a compliment not only to him personally but in both these representative capacities, as the head of a College which possesses a virile and progressive medical school, and as the head of the educational and registration authority of the medical profession of the Irish Free State. Before his appointment as President of University College, Dr. Coffey was for some years Professor of Physiology in the Cecilia Street School of Medicine. He was both an original worker of much ability and an attractive teacher. Many feel that his transference to administrative duties deprived physiology of an investigator of great promise. In 1912 Dr. Coffey was given the Honorary Degree of LL.D. by the University of Dublin.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

The Local Government Act.

Now that the general election has ended in a Labour victory, several parishes, burghs, and education authorities in Scotland have passed resolutions asking for a suspension of the Local Government Act until certain matters are reconsidered. The Glasgow education authority is among the first to make this demand. The problem of the parishes, however, is not the same as the problem of the burghs, or of the education authorities. The demand for suspension is not a simple matter. The protesters will soon realise what an intricate and closely knit measure the new Act is. It involves immense financial reconstruction, which is the product of about 40 years' investigation and criticism. In Scotland, ever since the Balfour of Burleigh Royal Commission (over 30 years ago), the problem of rates, site values, and kindred questions has never died down. Committee after committee has attempted solutions, but until now nothing serious has emerged. In the new Act, at one stroke, the local authorities are re-formed and grants rearranged in such a way that no authority suffers. These measures cannot well be reversed and even "suspense" might end in great confusion. Apart from this, however, the mere merits of some of the new provisions—e.g., the hospital clauses—will commend those provisions to every reformer anxious to see sickness taken out of the poor-law. This is one of the great achievements of this century and no Government will readily go back to the old muddle. There are many other points to argue upon, but the importance of the present protest lies in the fact that they arise almost before the Act comes into operation.

One very important point emerged when the Bill was in committee and Section 36 is a partial answer to it. In Scotland, the city councillors do not all go out of office at one time. In Edinburgh, for example, a third of the town councillors (over 70 in number) retire each year. It has been suggested that, at the first election under the new Act, the whole town council should retire and a new council be elected. This is what happens with the county councils and the education authorities, and it gives better scope for the men and women of the old authority to become candidates for the new concentrated authorities. If only one-third of the town council retires, the new candidates, who must face problems of education and poor-law as well as public health and other town council work, will be limited to those who contest one-third of the seats. It would certainly be better, on the whole, if the town councils, like the county councils, went out of office to the full extent of their membership. Otherwise, the two-thirds remaining in office, who were appointed without reference to the new duties, will dominate the situation. This point is one that may well be reconsidered.

Artificial Cream.

The Department of Health for Scotland has issued a circular explaining the new Act concerning artificial cream. This is a much more important circular than its length indicates. Artificial cream has been experimented with for several years, but it did not seriously affect the market until the use of all preservatives in cream was forbidden. It was soon discovered that, while the ordinary market for immediate or rapid consumption domestically could be, on the whole, supplied without much difficulty, the baker and confectioner market could not. The cream used for cream cakes, and various confections, could not, without preservative, maintain its freshness for the long period required and, almost immediately on the appearance of the anti-preservative regulations, bakers and confectioners began to use "reconstituted" cream, and the trade journals were soon full of pictures of emulsifying machines. The reconstituted cream was "genuine" in the sense that it was made up of butter-fat, dried milk, and a proportion of water, and, as it could be made sterile from the start, it served the purpose better than cream that in less than 24 hours went sour. The usual protests were made; the cream trade alleged prospective ruin and unfair competition. Unfair in one sense the competition certainly was, for reconstituted cream is not fresh cream—that is, "that portion of natural milk rich in milk fat which has been separated by skimming or otherwise." But artificial cream is a wholesome food product and the real unfairness only begins when it is passed into the market as "cream." The trade protest has been successful and artificial cream must now be so defined. In other words, measures are obligatory to let the consumer know what he is buying. The curious point is that, although cakes and confectionery were a material factor in the protest, "the Department are advised . . . however, that the Act does not apply to fancy cakes or confectionery containing cream so prepared, or to ice-cream." The new powers are stringent; but they do not interfere with the manufacture of this excellent food so long as it is frankly labelled by its proper name. It is difficult to avoid the reflection that if the creameries and dairy farmers had spent more time and energy in producing "clean" milk and cream, they need not have suffered such loss of trade as the growing popularity of artificial cream is sure to involve.

Mental Defect.

Addressing the annual meeting of the Scottish Association for Mental Welfare held recently in Edinburgh, Prof. G. M. Robertson spoke of the serious consequences to society if the lives of sub-normal persons were not supervised. It was now possible to form some idea of the extent of mental defect, and though previous estimates had been high they had evidently not been high enough. It appeared that about eight out of every thousand persons living were mentally defective, and that the number of defectives in England and Wales amounted to about 300,000 of the population. Accepting those calculations as the proportion that also existed in Scotland, the number of defectives in this country was about 40,000. Those who gave rise to most anxiety and trouble were the young adult defectives of the higher grades. Endeavours must rest on the basis of a tripod of three distinct operations: early detection and appropriate training when young; a suitable occupation, protected from unequal competition, when adult; and friendly supervision of life at home. When after-care work had been well organised on those lines, the records of old pupils of special schools had been encouraging.

Effect of Influenza on the Death-rate.

The returns made for the first quarter of the year by the Registrar-General for Scotland show deaths numbering 26,386. This number is 10,527 more than that of the previous quarter, and 5503 more than the mean of those of the first quarters of the preceding ten years. Since national registration was started in 1855 the only quarters in which greater numbers of deaths were registered were the last quarter of 1918 and the first quarter of 1919, when the numbers were 28,619 and 28,959 respectively, the high mortality then as now being largely attributable to influenza. In the first quarter of this year deaths from influenza numbered 3035, of which 409 were attributed to influenza as a sole cause, and 2626 to influenza with some contributory cause. Deaths from bronchitis, pneumonia, and influenza during the quarter numbered 9581, the corresponding figures in the previous quarter and in the first quarter of 1928 being 2664 and 3768 respectively.

National Health Insurance.

At the annual conference of the Scottish National Association of Health Visitors, Women Sanitary Inspectors, and School Nurses, held at Dundee on June 1st, Dr. A. S. M. Macgregor, medical officer of health for Glasgow, in the course of an address on the Coöperation of Public Health Services said the Insurance Act began by saying that it was an Act for the prevention and treatment of disease. The prevention of disease really meant that proper attention could be secured at the earliest possible moment. This was not yet possible in the case of children, and it would meet these very grave defects if the medical benefits were extended to the children of insured persons. It would allow clinics to perform special functions and the diseases of children would be properly looked after. He was satisfied that this would come sooner or later, but he was sorry that the Commission on the Insurance Act had not made this their first consideration.

Lady Cowdray recently presented the title deeds of the Viscountess Cowdray College of Nursing to the Aberdeen branch of the College of Nursing Club—a gift estimated in value as over £20,000. It is understood that this gift is associated with the thanksgiving movement for the King's recovery.

The new department of zoology, which was formally opened on May 15th by Prince George, fulfils a long felt want at the University of Edinburgh. It is the second of the "King's Buildings"—the first of which, the new chemistry department, was opened in 1924—and occupies an open site on the southern outskirts of the city. The scheme for its erection was originally made possible by a gift of £20,000 in 1923 from the late Mr. Pullar. This was augmented in 1926 by £18,000 from the trustees of the Carnegie Trust for the Universities of Scotland and subsequently £74,000 was received from the International Education Board of which Mr. J. D. Rockefeller, jun., is the founder. At the opening of the new buildings, Sir Alfred Ewing, the Vice-Chancellor, pointed out that the University owed these gifts mainly to the scientific reputation, personality, and unsparing efforts of the present occupant of the chair of zoology, Prof. Ashworth.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

An Order of Physicians.

A GREAT fuss has been made for some time past about setting up an "Ordre des Médecins," a sort of disciplinary body within the profession, similar to that established by the barristers in the French law courts. Many leading medical men think it might be useful and that it would stop the activities of the very small number of physicians who lack elementary morality and employ their skill, which is often considerable, in ways which are not legitimate. Prof. Balthazard has asked his colleagues of the Academy of Medicine to vote an address to the Government supporting the scheme, and a young doctor has lately chosen the subject for his inaugural thesis. There are those, on the other hand, who think it useless to introduce a court which would probably have no other authority than that of the ordinary judges. Parliament will have to take the matter up, for a deputy, who is not a doctor, has put forward a proposal for a Bill to create an Order of the kind envisaged. This does not, of course, mean that it will soon come up for discussion, for the Parliaments of all countries have the same disregard for professions which represent so small a number among the voters. Many a practitioner likes to recall that even in his youth he had already heard a great deal of talk about the proposal and that nothing has been done about it with the passing of the years.

Practice and Pharmacy.

In France the physician is not allowed to sell drugs to his patients; he must write his prescription and have it dispensed by a pharmaceutical chemist. The law makes one exception, however. When there is no chemist within 7 kilometres (4¼ miles) the medical man may prepare and sell drugs of his own prescription. He is then called a "propharmacien," a word that does not seem to have any equivalent in English. These "propharmaciens" number 2700 on French territory and have held recently a meeting in Paris. The principal object of the meeting was to consider their attitude towards the new measure of social insurance. As a matter of fact they had been simply forgotten when the Bill was drawn up, and as the pharmaceutical profession is, in France, protected by very strong laws, they expected, unless some alteration was made, to be deprived of their ancient right to sell drugs to the insured patient. Naturally this is of no little importance to them since half, or at least a third, of their income is derived from such sales, it was also of importance to the people they served who would have been obliged to go to the next chemist to fetch their drugs, sometimes at a distance of 10 and 12 miles. The funny part of the business was that when their representatives went to explain these facts to the man in charge of the technical direction of the social insurances they were surprised to find that the eminent director had not the slightest conception of their status and thought they were duly qualified pharmacists who had also taken medical diplomas—an entirely different thing in the eyes of the law. As soon as the misunderstanding was cleared up an agreement was reached and now the propharmaciens are out of danger.

New Antistreptococcal Serum.

Prof. Vincent claimed at the last meeting of the Academy of Sciences that he has prepared a new antistreptococcal serum of real curative power. Hitherto, he said, the streptococcus has been regarded as producing a very low degree of immunity in animals so that the serum prepared against it has not been very reliable By selecting suitable strains of streptococcus giving strong reactions in horses he has obtained a serum with a high power of immunisation. Three cases were described in which it has given excellent results.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Mental Hygiene.

THE mental hygiene movement continues to progress with rapid strides. This spring the new Neurological Institute, costing two million dollars, has been opened as an integral part of the Medical Centre at 169th Street, New York City. At the dedicatory ceremony both Mr. Robert Thorne, the president of the institute, and Dr. Frederick Parson, the New York Commissioner of Mental Hygiene, emphasised the importance which would be attached to research work and to preventive medicine.

Although New York State authorised the expenditure of 50 million dollars for its mental institutions in 1923, there is now urgent need for further expansion. The new Governor, Mr. Franklin D. Roosevelt, has been appealing to the public over the radio to support his demand for another bond issue of equal size to that authorised six years ago. He says that the number of patients in these institutions is increasing at the rate of 2000 per annum, and that by 1936 New York will have 20,000 more mental patients than there are beds for. Even at the present time the Manhattan State Hospital is compelled to house 7000 patients, though its proper capacity is for only 4800. In Illinois the State Mental Hygiene Association is pressing for a 40,000,000 dollar ten years' building programme to relieve congestion in the mental hospitals of that State.

In some parts of the country enthusiasm for the eugenic attack upon mental disease is getting well beyond the bounds of prudence. In the Missouri State legislature, for example, a Bill has been introduced which would make it obligatory upon the court to order the sterilisation not only of the insane, feeble-minded, and epileptic, but also of all persons convicted of "murder (not in the heat of passion), rape, highway robbery, chicken stealing, bombing, or theft of automobiles." Concerning this Bill and others like it, the *Mental Hygiene Bulletin*, the official publication of the National Committee for Mental Hygiene, has the following comment:—

"Almost without exception these Bills are scientifically unsound, when they are not technically absurd, and frequently they are drafted without the assistance of even the meagre scientific knowledge that we now possess with regard to the laws of heredity, the causes of the complex phenomenon of crime, and the basic principles of a sound sociology. Worst of all, they place, potentially at least, an appalling power to wreak private vengeance in the hands of politicians, motley boards of officialdom, and politically-influenced or professionally-mediocre doctors of medicine who do not begin to comprehend the possibilities for evil of such hastily concocted "remedies" for the ills of society...What we need is a great deal more scientific research in the field of human biology, especially with regard to the mechanisms of human heredity, and the inheritance of native and acquired characteristics. We ought to have research of a genuinely impartial nature into the results obtained in those States which have actively functioning sterilisation laws before writing any more grotesque, unsound, and thoughtless legislation into our statute books."

Standards for mental hygiene work have been formulated after careful study and investigation in a "suggested survey schedule" for the study of "Mental and Functional Nervous Diseases" by the American Public Health Association. Copies can be obtained from their offices at 370, Seventh Avenue, New York City.

A Tuberculosis "Cure."

Mail fraud indictments have been issued against five men in connexion with an alleged swindle claiming to provide a cure for tuberculosis. Post office inspectors estimate that 10,000 people have been victimised and that the "healers" have collected approximately a million dollars in fees and sales of "guaranteed cures." Government chemists and medical experts are said to have filed reports stating that the preparations sold by the alleged combine could produce no beneficial effect in pulmonary disease. The San Romay Company, as the organisation was called, appears to have operated from Los Angeles with a branch office in Denver.

MEDICINE AND THE LAW.

Doctor's Trial for Manslaughter.

THE jury disagreed at the Central Criminal Court on June 4th on the trial of Dr. Hugh Windsor Bell, an anæsthetist, of Oakley-street, Chelsea, for the manslaughter of Miss Kathleen Kelly. At the original proceedings in May, at the Marylebone Police-court, the wife of Dr. Bell was also charged, it being alleged that Dr. Bell performed an illegal operation upon Miss Kelly by himself at the house of a Mrs. Capper at Kensal Rise, but that Mrs. Bell knew it was to be done, took some part in arranging it and afterwards sought to take the blame, saying that she had performed the operation with her husband's instruments. The magistrate discharged Mrs. Bell owing to the lack of evidence against her, and committed Dr. Bell for trial. Dr. William L. Harrison, of Granville-gardens, Shepherd's Bush, who attended Miss Kelly's family professionally, stated that he had been consulted by her in February and March. In April she was brought to Dr. Bell by Mrs. Capper. Dr. Bell stated that he found Miss Kelly to be pregnant and formed the opinion that a miscarriage had started. He advised her to enter a nursing-home, but she refused (being anxious that her mother should not know of her condition) and she arranged to go to Mrs. Capper's house instead. She offered him £75 to attend her so long as necessary and paid him in notes. He came to the conclusion that it was necessary to perform an operation, which was perfectly legal. He stated that, in performing it, he thought he accidentally made a punctured wound of which he was not aware at the time. In cross-examination he agreed that, upon his evidence, Miss Kelly must have performed an illegal operation upon herself, but that he had not disclosed this fact to the coroner. Dr. A. W. Bourne, of Harley-street, stated that in complicated cases the operation described by Dr. Bell was a common practice.

The charge against Dr. Bell now stands postponed till next Sessions for trial before a fresh jury. In the circumstances further comment would be improper. Something may, however, be said of the general question, raised in the course of the case, as to whether the charge should have been one of murder or merely of manslaughter. At the police-court the magistrate thought at first that the accused ought to be committed for murder. Defending counsel contended that a man should not be put to the pain of being committed on a charge on which he was very unlikely to be convicted or even tried, and the magistrate allowed the charge of manslaughter to stand. At the Central Criminal Court the prosecuting counsel seems to have imparted a little prejudice by observing that Dr. Bell might consider himself fortunate not to be charged with murder. Upon this, Mr. Justice McCardie remarked that the essence of murder was intent to kill, and he was glad that there had been no attempt to present a charge based on the harsh, mediæval, and, in his view, repulsive doctrine of constructive murder.

Constructive Murder.

The doctrine of constructive murder has to deal with cases of unintentional killing by a person doing or attempting to do an act other than murder. Here there are three grades of homicide of ascending gravity. First, if the act was lawful, the unintentional killing is merely homicide by misadventure. Secondly, if the act is unlawful but not felonious, the killing is manslaughter. For example, to kill a trespasser while kicking him out with unnecessary violence, or to kill a man in the course of an unlawful assembly, would be manslaughter. Thirdly, if the act intended or attempted is felonious, then the killing is murder. Thus, to take the example familiar in the text-books, to kill a man unintentionally while firing a gun at somebody's hens in order to steal them, is regarded as murder, because the stealing would be a felony; on the other hand, to kill him while firing at the poultry without any such intent of stealing would be manslaughter. Such is the legal theory, dependent—it will be noticed—upon the anachronistic distinction between crimes (not always the most serious) classified as felony and crimes (not always the least serious) classified as misdemeanour. The full doctrine of constructive murder has not escaped judicial criticism. Stephen thought that the case ought not to be murder unless the act is one known to be dangerous to human life—such as unintentionally causing the death of a human being by burning down a house with intent to defraud. In the application of the doctrine to cases of alleged criminal abortion a certain difference of opinion manifests itself on the bench. Lord Mersey, when presiding over an assize court, once told the jury that, if they thought the deceased woman died as the result of an unlawful operation performed by the accused, he was guilty of murder; but he added that, if they thought the accused could not as a reasonable man have expected death to result, they might find a verdict of manslaughter. This reasonable view has commended itself to other judges, though it is unfortunate that the legal position should here be a matter of personal practice rather than of universal and established principle. The tendency to seek verdicts of manslaughter rather than of murder where deaths result from criminal abortion should not be regarded as a weakening of the administration of justice. As is possibly indicated by the working of the Infanticide Act of 1922, juries may prove more ready to convict if their verdict does not involve a sentence of capital punishment.

Obituary.

SIR WILLIAM FAIRBANK,

HON. SURGEON TO HIS MAJESTY'S HOUSEHOLD AT WINDSOR CASTLE.

WE regret to announce the death of Sir William Fairbank, so well known for his long and intimate association with the Royal Household at Windsor, which occurred at his residence, Moulsey House, Windsor, on Sunday last, June 9th.

William Fairbank was born in 1850, the son of Mr. Thomas Fairbank, a Yorkshireman. He was educated at Forest School and proceeded to St. Bartholomew's Hospital, where he joined the medical school, obtained prizes in anatomy, and qualified in 1872 as L.S.A. Lond., and in the following year as M.R.C.S. Eng. His skill as an anatomist was recognised by his appointment to a prosectorship of anatomy at the College. Shortly after qualification he was appointed resident medical officer at the Royal Albert Edward Infirmary, Wigan, a post which he held for three years, and at the close of which he took the L.R.C.P.I. after doing obstetric work at the Rotunda Hospital, Dublin. His long association with professional, civic, and court life in Windsor commenced when, in 1880, his elder brother, Dr. Thomas Fairbank, died suddenly, as still a young man, and holding the position of Surgeon-apothecary to the Queen's Household at Windsor. Dr. Thomas Fairbank had been very popular in his official position, and succession to it was offered to the younger brother William, as well as the post of Surgeon-in-Ordinary to Prince and Princess Christian. These responsibilities William Fairbank discharged while also conducting a general practice. He was visiting surgeon to the Royal Infirmary, Windsor, surgeon to the police at Windsor Castle, and later was appointed Honorary Surgeon to Queen Victoria's Household. This post he held for 21 years, and in sequence became Surgeon to King Edward's Household for 10 years, and to King George's Household for the next 13 years, when he retired. As honours in direct connexion with these appointments he received the M.V.O. in 1911, was promoted C.V.O. ten years later, and K.C.V.O. in 1924, while in 1919 he was made O.B.E.; he received the Jubilee medal in 1887, with bar in 1897, and the Coronation medals of King Edward and King George.

Apart from his Court appointments and private practice, Sir William Fairbank found time to discharge important civic duties. For many years a member of the Corporation of the Royal borough, he was Mayor of Windsor in 1919-20, and deputy Mayor in the following year, out of which appointment arose the interesting connexion between Hardecourt-aux-Bois and Windsor, for Fairbank was one of the mayoral delegates to France deputed to visit the ravaged districts, and, after the adoption of Hardecourt-aux-Bois as a special charge upon Windsor, he raised funds by his individual endeavour for the re-erection of the village. From that date forward he visited Hardecourt-aux-Bois every year to the material benefit of the inhabitants whose orchards and gardens he restocked, and whose inhabitants showed their gratitude by gracefully naming after him their main carrefour.

Sir William Fairbank was a member of the Berkshire County Council, and a County and Borough magistrate, while he was also chairman of the Commissioners of Inland Revenue for Windsor and Maidenhead and of the Windsor and Maidenhead Insurance Commission. In two further directions he notably assisted the medical welfare of the community, for he was a pioneer in education and in emergency medical aid. He was a Governor of Holloway College, the leading spirit of the St. John Ambulance Brigade of the district, and a Knight of Grace of the Order of St. John of Jerusalem. For nearly 40 years he gave first-aid lectures in Windsor and Slough, and it was at his initiate that first-aid facilities became available at many railway stations in the country, the lack of such facilities on the Great Western Railway having attracted his attention. At the time of his death he was honorary consulting surgeon to King Edward VII. Hospital, Windsor.

A life so full of public interest was closed by some years of ill-health. A severe operation did not preclude recurrences, and for some time before his death he was in a very serious condition, though he continued to see a certain number of old patients. He was a widower, his wife, the daughter of Mr. John Woodcock, J.P., having died five years ago; but he leaves three daughters and two sons, one of whom is Mr. H. A. T. Fairbank, orthopædic surgeon to King's College Hospital.

SIR CHARLES O'BRIEN HARDING,

M.R.C.S. ENG., L.R.C.P. LOND.

WE regret to announce the death of Sir Charles O'Brien Harding, so prominently known in connexion with medical and civic work in the borough of Eastbourne, which occurred on June 7th, in the seventy-first year of his age, and after some months of ill-health.

Charles O'Brien Harding was the son of a medical man, Mr. John Fosse Harding, and was one of the numerous successful doctors who have received their education at Epsom College. In 1879, after some preliminary work at the Sussex County Hospital, he became a student at St. Bartholomew's Hospital and obtained the M.R.C.S. Eng. and later the L.R.C.P. Lond. He filled the office of house surgeon at the hospital, and also became distinguished as a player of Rugby football, for he was captain of the St. Bartholomew's team which wrested the inter-hospital cup from St. George's Hospital, where it had remained for several years, played for the United Hospitals, which was in those days a team with a fine match list, and also appeared for Middlesex.

On leaving the hospital he went certain voyages as surgeon to the Orient Steam Navigation Company, and then began private practice in Highbury, holding also the appointment of surgeon to the Holloway and North Islington Dispensary; but shortly afterwards he commenced practice in Eastbourne, where he became at once a popular and successful practitioner and associated himself prominently with the development of the great watering-place.

The interest which he showed in the public life of Eastbourne and the confidence and esteem which he enjoyed among his fellow-citizens are displayed by the fact that for 35 years he served continuously on the Town Council, was Mayor of the borough no less than six times, and was largely instrumental in the erection of the town into a county borough 18 years ago. For 25 years he was a magistrate, and as a regular attendant on the bench he proved himself alike generous and impartial, and when, at the end of the war, in recognition of a strenuous mayoralty during 1915-19, he received the honour of knighthood, all who knew him, and they were many, could see in his public and in his professional career the undoubted merits which had won him the distinction. He was presented publicly with his portrait by a large group of friends, and this hangs in the public offices of Eastbourne.

Sir Charles Harding married in 1889 Amy Roberts, who died in 1902, and he leaves five children, three sons and two daughters.

GENERAL MEDICAL COUNCIL.

SUMMER SESSION, 1929.

COMMITTEE AND OTHER BUSINESS.

Dr. W. C. Rappleye, Director of Studies of the Commission on Medical Education organised by the Association of the American Medical Colleges, and Dr. A. S. Erulkar, Physician to the King Edward Memorial Hospital, Bombay, were present throughout this session at the invitation of the Council.

The following members were re-elected to the Penal Cases Committee: Sir Robert Bolam, Mr. H. L. Eason, Sir Norman Walker, and Dr. D. J. Coffey.

The Pre-medical Examination.

In moving the report of the Education Committee, Sir Humphry Rolleston commented on various matters which had been remitted to it. The first of these was a correspondence with the Conjoint Board of England. In December, 1928, the Council had addressed a letter to the Board, pointing out that its regulations allowed a student to commence his course of study for the first professional examination before the pre-medical examination in chemistry and physics, and that he might complete his professional curriculum at a medical school in less than five academical years, the minimum time laid down in the resolutions of the Council for the course of study for a medical qualification. The Board had thereupon pointed out that at least one university in the United Kingdom allowed 12 months of study of chemistry and physics after matriculation to be counted as part of the regular medical curriculum; a student could therefore obtain his degrees after four and a half years at a medical school. The Board itself recognised, as part of the regular curriculum, a period of not more than six months, science study at a recognised school, after the preliminary examination. No candidate could therefore obtain his diplomas without completing four and a quarter years at a medical school; three academic years must be devoted to clinical subjects after the examination in anatomy and physiology. The two terms of anatomy and physiology *that might be taken before* the pre-medical examination did not count as part of the regular medical curriculum of five academic years. This point had not been made clear in the Regulations, and the Board's committee of management was recommending to the Royal Colleges that all the five terms of anatomy and physiology should be taken after the pre-medical examination. The Board also proposed to recommend the institution of an examination in elementary biology as Part 2 of the pre-medical examination. In this event, two terms of anatomy and physiology would be taken before Part 2 of the pre-medical examination. The Education Committee, after considering the matter, had formed the opinion that provided the medical course lasted for five years after the pre-medical examination, and that not less than three years remained available after the examinations in anatomy and physiology, teaching and examining bodies were free to arrange the curriculum as they thought fit.

Antedating of Medical Study.

Correspondence has also taken place with the University of St. Andrews in regard to the antedating of medical students. There were three cases in which students, having passed the pre-registration examination in December, applied to be antedated to October, which was the date when they began their work in the University. This was refused on the ground that the Resolutions of the Council, which came into force on Jan. 1st, 1923, provided that—

> "before registration as a student or commencement of of the regular medical curriculum every person shall be required to pass, in addition to an approved examination in general education, an examination or examinations, conducted or approved by one of the Licensing Bodies, in the subjects of physics (theoretical and practical) and chemistry (theoretical and practical)."

In the reply the University admitted that the time spent in the study of pre-registration subjects had been part of the time recognised by antedating, but said that during the same period the students had been studying botany and zoology as subjects *for the first professional examination, and that*, under their regulations for the pre-registration examination, the same attendance which prepares the candidate for this in chemistry counts afterwards as the first stage of the instruction for the first professional examination in that subject. The correspondence continued, and eventually the Secretary of the University had written:—

> "So far as I can see, the situation is this—either registration is of some moment to the student, in which case several of our students have been disadvantaged; or the registration is of no service whatever to the student, and in the circumstances the university need not go out of its way to advise the student to register with the General Medical Council, more particularly if the Council refuse to antedate, although they have power to do so."

By the President's direction the Secretary was therefore asked to state whether or not his university had fully considered the question and had deliberately *decided that in future they would not follow the* Resolutions of the Council, and that they would permit students to begin the regular medical curriculum before they had passed an approved examination or examinations in physics (theoretical and practical) and chemistry (theoretical and practical).

The Committee, said Sir Humphry, were somewhat surprised that after this length of time there should be any misunderstanding as to the views of the Council, which are quite clearly set forth in the Resolutions in regard to professional education. It was highly desirable for statistical reasons that all students should be registered. Hitherto the Scottish Bodies had been particularly loyal in adhering to this view, and the Committee considered that it would be a matter for great regret if the University of St. Andrews discontinued the practice. At the same time the Committee desired to indicate that the point at issue is not whether or not students should be registered, but *whether or not the University* is prepared to conform to the Resolutions of the Council. The Committee would await with interest the decision of the University.

Age of Matriculation.

The Committee had received the following resolution passed last December by the Headmasters' Conference:—

> "That this Conference regrets the tendency of the regulations of the General Medical Council now in force to encourage too early a matriculation age; and urges that the Medical Council and the licensing bodies should be approached on the matter."

The Secretary had added that the point of the resolution was that headmasters deprecate matriculation at the age of 16, which some universities are now prepared to tolerate in order that intending medical students may take their pre-registration *science course at the university. Headmasters* were emphatically of the opinion that school is the right place for this work and the right place for students of that age.

The Committee reported that it was somewhat at a loss to understand why this resolution was passed. Considerable correspondence had taken place between the Registrar and the mover of the resolution, to whom it had been made clear that the Council, when they changed the minimum age for the registration of students from 16 to 17, had considered whether it was advisable to make the age 18, but they had come to the conclusion that the time had hardly arrived for this. The idea they had in mind was that the average boy would pass his examination in general education at about the age of 16½ to 17, and would remain at school for a further year in order to study the further subjects of elementary chemistry and elementary physics, after which he would proceed to the university or medical school where his curriculum proper would begin at about the age of 17½ to 18.

The Education Committee were of the opinion that it is advantageous that a boy should study the pre-registration subjects at school and remain there as long as possible. It is not, they consider, in his interest that he should go to a university or medical school too young. If means were devised whereby a boy could obtain a school certificate with credits in elementary chemistry and elementary physics and with a theoretical and practical examination in each, which of course would have to be passed in addition to the examination in general education, this would meet the views of the Education Committee as a minimum, and might help to solve some of the difficulties set forth at the Headmasters' Conference.

The report of the Examination Committee contained detailed tables of exemptions from courses of study and examinations granted during the year. Other tables showed results of examinations held by all the Licensing Bodies. These tables are expected to be of great value in assisting the various bodies to coördinate their policy. All the Licensing Bodies have agreed to the publication of the Visitors' Reports on the examinations in pathology and materia medica. This record should be of use in enabling the bodies to study one another's procedure.

On the joint advice of the Education and Examination Committees, the Council decided to resume the inspection and visitation of qualifying examinations early in 1930.

Finances.

The income of the Council and all its branches showed decreases due to the falling off of registration fees. The prolongation of the last Summer Session over the Whit holidays resulted in an increase of £690 in the fees paid to members, and of £106 for extra programmes and minutes. The deficit of £1285 was the first one recorded since 1911, and represented three years' arrears of income tax, together with the cost of the appeal. But for these exceptional items, there would have been a surplus of £396. Sir Holburt Waring prepared the Council for a possible slight deficit at the end of the current year, but remarked that the financial position of the Council was thoroughly sound and that, if there were a deficit, it could well be set against the substantial amounts saved in the last 17 years.

The Pharmacopœia Commission.

The number of copies of the British Pharmacopœia, 1914, sold was 2222—an increase on the preceding year.

The Pharmacopœia Commission is meeting weekly, and has now held 13 meetings. Mr. Charles Herbert Hampshire, M.B., B.S., Ph.C., has been appointed Secretary from June 1st, and has already been attending meetings of the Commission, which has made substantial strides in the formidable task before it. It has drawn up lists of suggested omissions and additions to the Pharmacopœia. These will be circulated to various bodies in the United Kingdom, Dominions, and Colonies for criticism. It has already received, from the Canadian Committee on Pharmaceutical Standards, lists of proposed omissions and additions, together with other important suggestions. It has set up panels of reference in various subjects; valuable advice has already been received from those dealing with pharmacology anæsthetics, skin, nose and throat diseases, and tropical medicine. t is in communication with the Advisory Committee ppointed under the Therapeutic Substances Act, nd has considered various substances dealt with n that Act. At one of its meetings Dr. Hartley (of the Medical Research Council's Department of Biological Standards) was present and offered valuable assistance. It hopes to get into touch with the Pharmaceutical Society on the subject of the Codex, a new edition of which is being considered. It hopes to bring about an understanding whereby the Codex would be truly supplementary to the Pharmacopœia, and contain an authoritative description of drugs and preparations which either have never been, or have ceased to be, in the Pharmacopœia.

The subject which at the moment is giving the Commission the greatest concern is that dealing with pharmaceutical work which will require to be done. Statements made in the monographs of drugs to be retained in the Pharmacopœia will require careful revision; in writing monographs of new drugs many statements about them will require verification before they can be accepted. The Commission have not yet before them information as to laboratories, outside those connected with trade, where such work could be done; to be of any value the work must be performed carefully, within a definite space of time, and with due regard to economy. The Commission will, as soon as possible, put forward the plan which in the circumstances seems to it best to fulfil these requirements.

Col. Norman C. King was reappointed General Registrar.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdr. T. A. Smyth is placed on Retd. List with rank of Surg.-Capt.

The following appointments are notified: Surg.-Comdr. W. I. Gerrard to *President*, for Medical Dept.; Surg. Lt.-Comdr. M. B. Devane to *Stuart*, to be accommodated in *Valentine*; Surg.-Lt. A. L. Moorby to *Sandhurst*.

ROYAL ARMY MEDICAL CORPS.

Col. A. O. B. Wroughton, late R.A.M.C., retires on retd. pay.

Lt.-Col. J. T. Johnson, from R.A.M.C., to be Col.

Maj. A. E. S. Irvine to be Lt.-Col.

The undermentioned Capts. to be Majs.: G. D. Yates, J. W. Malcolm, C. C. G. Gibson, B. H. C. Lea-Wilson, H. G. Hobson, G. J. McGorty, and J. S. B. Forbes.

ARMY DENTAL CORPS.

Capt. S. A. Rodda to be Maj.

TERRITORIAL ARMY.

Col. J. S. Warrack retires on completion of tenure as A.D.M.S. 44th (Home Counties) Div., and retains his rank with permission to wear the prescribed uniform.

Capt. H. Mather to be Maj.

Capt. J. H. Mellotte resigns his commn.

Lts. G. W. Elkington and T. F. Greenhill to be Capts.

Lt. C. C. P. Anning resigns his commn. on account of ill-health.

G. P. Smith and A. V. Mackenzie (late K.S.L.I.) to be Lts.

ROYAL AIR FORCE.

Flight Lt. C. T. O'Neill is promoted to the rank of Squadron Leader.

The undermentioned Flying Officers are promoted to the rank of Flight Lt.: G. W. McAleer and E. P. Carroll.

INDIAN MEDICAL SERVICE.

Lt.-Col. F. A. F. Barnardo retires.

COLONIAL MEDICAL SERVICES.

The following new appointments have been made by the Secretary of State for the Colonies during May: Dr. C. D. Williams, Lady M.O., Gold Coast; Dr. J. C. D. Carothers and Dr. G. C. Young, M.O.'s, Kenya; and Dr. R. B. S. Smith, M.O., Northern Rhodesia. Dr. W. Crawford and Flying Officer J. T. Sorley have been appointed to the West African Medical Staff.

CHELTENHAM GENERAL HOSPITAL.—Extensive enlargements, which have cost £32,000, have now been completed. The additions include a new wing with two wards of eight beds each, six wards for private patients, and a well-equipped electro-therapeutic department. The nurses' home has also been extensively enlarged.

Correspondence.

"Audi alteram partem."

THE EXAMINATION OF TUBERCULOSIS CONTACTS.

To the Editor of THE LANCET.

SIR,—Appreciating as I do the *obiter dicta* of THE LANCET, it seems only fair to express an earnest *caveat* regarding the opening statement in your leading article of June 8th on Early Mortality from Tubercle. The sentence runs as follows: "One of the least profitable duties of the tuberculosis officer is that which concerns the examination of 'contacts.'" The statement cannot be accepted without serious qualification and I am happy to notice that in a subsequent reference to "the examination of contacts" the words are added, "as usually conducted." This makes all the difference possible.

As largely responsible, long ago, for the introduction of the systematic examination of contacts, I find myself to-day more than ever convinced as to the supreme significance of the measure with a view to the eradication of tuberculosis. It is none the less certain that, if the purpose of the procedure be misunderstood, or lost sight of, and if misdirected methods be followed, the so-called examination is likely to be futile. The picture you draw of the examination "as usually conducted" certainly makes one uneasy. The indication that, in such examination, the tuberculosis officer's outlook is towards the detection of *pulmonary* disease does not suggest the pathological knowledge of the live problems of tuberculosis which one would hope for in the specialised service. The majority of tuberculosis officers are surely not thus limited in vision. I am glad to be in frequent contact with men whose outlook is entirely different.

There is imminent need for greater breadth of instruction regarding tuberculosis in the case of medical men preparing for the health services, as well as undergraduates. The objective of current teaching in many places remains as it was a generation ago, that is, the diagnosis and treatment of pulmonary tuberculosis with a side glance at other manifestations of tuberculosis. This seems to me entirely wrong. A satisfactory outlook on the far-reaching problems of tuberculosis should have regard to facts observable in the experimental animal, facts of comparative pathology and the successive stages in the natural history of tuberculosis in the human subject. The "reconstruction" of the natural history has been rendered possible during the present generation through continuous observation of the evolution of tuberculosis in the same individual from infancy throughout thirty or more years. The serious worker in tuberculosis ought nowadays to be so familiar with the natural history of tuberculosis that a thorough clinical examination, *appropriate to the age of the individual* in question, may be rapidly overtaken and supplemented by bacteriological tests when the first line of evidence requires corroboration. In this connexion I am unable to subscribe to your statement that the so-called "tuberculous seedling" is not the precursor of the consumptive adolescent.

In illustration of the value of comparative pathology let me cite an example of much significance. Recently, in our tubercle-free herd (some 50 cows) in connexion with Gracemount Farm under the Tuberculosis Trust, the long continued series of negative reactions to the tuberculin test was broken by a young cow which, six months before, had passed the test successfully. In the interval between the two tests—exactly six weeks before the latter test—the cow in question had been allowed into a park not attached to our farm. In the park were several cattle belonging to another herd with which our cow came naturally into contact, and one of those cattle was admittedly sick. In accordance with our plan for the maintenance of the tubercle-free herd, the reacting cow was immediately sent to the slaughterhouse. At the careful autopsy which followed, a single retropharyngeal gland was found much enlarged and definitely tuberculous. No trace of tubercle was found elsewhere.

Such observations in comparative pathology have illuminating and inspiring value in the search for evidence of tuberculosis in the human subject.

I am, Sir, yours faithfully,

R. W. PHILIP.

University of Edinburgh, June 8th, 1929.

To the Editor of THE LANCET.

SIR,—The opening paragraph of your leading article conveys at some length the surprising opinion that "one of the least profitable duties of a tuberculosis officer is that which concerns the examination of 'contacts.'" Having mentioned that the average mother will readily bring to the dispensary all the children of school age which she possesses, the article goes on, "The result is highly gratifying to all concerned, for unless the tuberculosis officer's imagination has been captivated by the possibilities of paravertebral percussion, he is able to report that the 'contacts' are not suffering from tuberculosis." This sentence seems to imply a singularly unflattering conception of the whole system of examination of "contacts." Indeed, it negatives the existence of any system of any kind.

All "contacts" of school age are in the first instance under the supervision of the school medical officer. They may be divided into two classes; (*a*) without symptoms, (*b*) with symptoms. With regard to (*a*), the importance of routine examination of children particularly exposed to tuberculous infection cannot, I think, be gainsaid. Class (*b*) comprises the vast majority of "contacts" of school age the tuberculosis officer meets with. A "contact" is brought for examination whose mother states that he has no appetite for his food, hsa been getting thin, has lost all his colour, has a nasty little cough in the mornings, and so forth. We will assume that the tuberculosis officer's imagination has not been "captivated by the possibilities of paravertebral percussion," we will assume further that he finds no definite physical signs of disease; his next procedure, according to the opinion expressed in your article, would be to assure the mother that the child is not tuberculous, shake hands all round, perhaps, and that's that! I doubt exceedingly whether a single tuberculosis officer exists in this country who would make a diagnosis, positive or negative, in such a case after one examination.

For instance, in the tuberculosis school clinic which I conduct in Hull, the routine followed in all such cases includes careful records of weekly weight, daily records of temperature and pulse when at all possible, skiagrams of the chest, examination at regular intervals with a thorough assessment of all symptoms and signs, and so on. All this is very necessary in each case. But the following extraordinary extract from your article would seem to indicate that such measures represent so much wasted time: "As a social investigation, as an opportunity for giving a little elementary instruction in the laws of hygiene the expedition may have been justified. From any other point of view the examination of contacts as usually conducted is futile, for, speaking generally, children of school age do not suffer from pulmonary tuberculosis." This sentence puzzles me. We know, of course, that pulmonary tuberculosis usually manifests itself in children in the form of hilum tuberculosis. (Some object to this term, but that is irrelevant in the present context.(Even apical phthisis of adult type is by no means unknown in school-children. (I have at present out of 44 children under 14 years, eight such cases, three of them T.B.+) Does the writer of your article deny the existence of hilum tuberculosis as a definite entity?

Finally, assuming that many "contacts" of class (*b*) type may not be demonstrably tuberculous, no one will deny that they are potentially so. And is not such a case from all points of view among the most important and, after treatment, the most gratifying of those with which the tuberculosis officer has to deal?

I am, Sir, yours faithfully,
P. RONAN FANNING,
Medical Officer, Hull Municipal Tuberculosis Sanatorium.

Cottingham, E. Yorks, June 10th, 1929.

CHORIONEPITHELIOMA IN A MALE.

To the Editor of THE LANCET.

SIR,—The annotation on this subject in your issue of June 1st (p. 1159) has many points of interest. In the case of the young man of 25 described by Drs. Tansey and Utz, the site of the primary tumour was in the left lung, and the authors suggest that chorionic cells had lodged in the lung since fœtal life, having got there from the maternal circulation. In commenting on this assumption, you prefer to make the admission that no adequate explanation of such a condition can at present be given, if it is certain that the malignant tissue is derived from chorionic cells. Now, it is a fact that primitive tissues are frequently "included" in normal differentiated tissues for long periods (e.g., moles, nævi, dermoid cysts) and that these primitive tissues sometimes become malignant. Adult tissues cannot, of themselves (i.e., in the absence of pregnancy), produce or grow into chorionic cells or tissues. Therefore, it is necessary to presume that when found in such an adult they have lodged there, and as they could not have got there since fœtal life, it appears quite certain that that is what actually occurs in these rare cases. Moreover, the occurrence may not be so very rare, as it is not usual to search for chorionic relics in post-mortem examinations other than those in which malignancy has been present. In support of the foregoing, I would mention the classical legal example of circumstantial evidence, that if a gold-fish is found in a bucket of water it is quite evident that someone has put it there. I cannot see any virtue in a course of action or a line of thought being "simpler" if it leads us to merely negative results," and I cannot agree that ". . . no adequate explanation of such a condition can at present be given." I submit that what occurs in such a case of "chorionic rests" going on to malignancy, is that these primitive cells are held in check by the body tissues, like any other foreign body would be, and there is a position of "stalemate" between the chorionic cells and the body tissues. If, however, general tissue poisoning takes place due to disease, &c., then (as I believe I have logically proved in my book, "The Cancer Mystery solved," 1927)—

> "these primitive tissues can only be precariously under trophic nerve influence, as they are not in their natural site in the body. There must be our first condition present, however, namely, general tissue poisoning. . . ." "As in all other cases of tumour growth, local irritation, producing local tissue reaction, is then required to produce local anaphylaxis and so damage trophic nerve control. The amount of local tissue reaction which is required to produce this loss of trophic control, in these cases, is very much less than in normal tissues, as these tissues are primitive and are under only weak trophic control."

It would appear then, that this patient's tissues become molecularly changed through poisons circulating in his system from bowels, teeth, food, or drugs, &c., &c., and that local irritation was supplied by the presence of the "chorionic rests," reinforced probably by tobacco smoking or an acute bronchitis. Local anaphylaxis occurred around the "chorionic rests" and so injury of the neurilemma of the trophic fibres in the vicinity. This, in turn, removed the restraining influence of the surrounding tissues upon the "rests" and they now grow in exactly the same way as very malignant *secondary* tumours might do, although in Drs. Tansey and Utz's article they are described quite correctly as "the primary tumour."

I am, Sir, yours faithfully,
ANDREW S. MCNEIL, L.R.C.P. & S. Edin.

Orpington, Kent, June 3rd, 1929.

THE ICTERUS INDEX OF THE BLOOD SERUM.

To the Editor of THE LANCET.

SIR,—Dr. G. W. Milroy, in your last issue (p. 1189), mentions hæmolysis as one of the sources of error in the technique of the icterus index. I have found hæmolysis a great source of trouble when serum is used and, in fact, a large number of specimens of serum, although clear to the naked eye, showed the bands of oxyhæmoglobin when examined by the spectroscope. Such specimens are useless for the icterus index.

Hæmolysis can best be avoided by withdrawing blood by a needle or syringe and needle previously washed out with normal saline and collecting it in a tube on whose inner surface a thin film of potassium oxalate has been deposited from a strong solution by evaporation. The oxalated specimen should be centrifugalised as soon as possible and the plasma withdrawn by a dry teat pipette. I have found plasma much easier to work with than serum and there is the additional advantage that one has not to wait until clotting occurs before completing the test.

If spectroscopic examination shows some hæmoglobin to be present the bilirubin cannot be estimated by the icterus index method and a quantitative van den Bergh reaction should be performed, since a small amount of hæmoglobin does not interfere with this test. I am, Sir, yours faithfully,

C. ALLAN BIRCH, M.D., M.M.S.A., D.P.H.

Royal Infirmary, Liverpool, June 8th, 1929.

LOCAL ANÆSTHESIA.

To the Editor of THE LANCET.

SIR,—In his note on Spinal Anæsthesia in your last issue (p. 1194), Mr. C. A. Pannett states that it is usual in any operation done under local anæsthesia with novocain to find sensation returning in an hour. This, he adds, is not peculiar to the spinal method: a drug which will produce prolonged anæsthesia is much wanted. For several years I have carried out all my plastic operations under local anæsthesia, and the majority of them occupy from two to three hours to perform. I use a 2 per cent. novocain solution in 0·9 per cent. sodium chloride, with 1 in 10,000 adrenalin.—I am, Sir, yours faithfully,

C. ABBOTT-BROWN.

South Molton-street, June 7th, 1929.

MEDICAL CANDIDATES FOR PARLIAMENT.

SUCCESSFUL AND UNSUCCESSFUL.

THE result of the Scottish Universities poll, to decide between four candidates for three seats, was announced on Monday last, and the name of Sir George Berry, who stood second in the final result, has now to be added to the list of medical men and women entitled to sit in the new House of Commons. The election was carried out on the proportional representation system, and the actual figures were as follows:—

Buchan, J. (C.)	9959
Berry, Sir George (C.)	9262
Cowan, D. M. (L.)	6698
Kerr, Dr. James (Lab.)	2867

At the declaration of the poll in Edinburgh, Dr. Kerr protested against the practice of issuing figures of the election from day to day, and the Returning Officer joined with him in deprecating a practice which seems to be quite unofficial in Scotland although accepted in a London University election.

Medical News.

UNIVERSITY OF LONDON.—At recent examinations the following candidates were successful :—

THIRD EXAMINATION FOR M.B., B.S.

With Honours.—C. F. Cosin (*a*) Guy's Hosp. ; E. A. Hunter (*a, c, University Medal*) London Hosp. ; A. L. Light (*a*), Univ. of Leeds ; E. G. M. Palser (*c*) Univ. Coll. Hosp. ; S. F. Russell (*d*) and H. A. H. Selbourne (*a*), St. Bart.'s Hosp. ; and C. E. W. Wheaton (*c*) St. Thomas's Hosp.

(*a*) Distinguished in Medicine.
(*c*) Distinguished in Forensic Medicine.
(*d*) Distinguished in Surgery.
(*e*) Distinguished in Midwifery.

Pass.—Lucy E. Arthur, and Mabel A. Baker, L.S.M.W. ; C. G. Bowen, Guy's Hosp. ; Annie G. Busher, L.S.M.W. ; E. C. B. Butler, London Hosp. ; Alison M. Clark, St. Mary's Hosp. ; Rosa O. J. Clark, L.S.M.W. ; S. L. A. Clarke, Guy's Hosp. ; Joan C. Clatworthy, Univ. Coll. Hosp. ; F. S. Cooksey, King's Coll. Hosp. ; Hilda C. Dean, Charing Cross Hosp. ; C. G. de Couilliard, Middlesex Hosp. ; V. P. de Zoysa, Univ. Coll. Hosp. and Ceylon Med. Coll. ; C. J. Donelan, St. Bart.'s Hosp. ; D. E. Dunnill, Guy's Hosp. ; Dorothy V. Dunolly, Univ. of Durham ; A. M. Easton, St. Thomas's Hosp. ; A. C. Elkin, Univ. Coll. Hosp. ; C. N. Evans, St. Bart.'s Hosp. ; G. S. Ferraby, King's Coll. Hosp. ; Kathleen E. Gambrell, L.S.M.W. ; Isaac Gordon, St. Bart.'s Hosp. ; D. P. Gray, Middlesex Hosp. ; Bridget S. P. Gurney, L.S.M.W. ; C. E. Hagenbach, St. George's Hosp. ; Emily M. Hall, St. Mary's Hosp. ; H. N. W. Harley and R. L. Harward, Guy's Hosp. ; F. F. Hellier, Univ. of Leeds ; C. F. Howes, St. Thomas's Hosp. ; E. C. H. Huddy and W. F. Hudson, Guy's Hosp. ; H. E. James, Univ. Coll. Hosp. ; Philip Kaplin, St. Mary's Hosp. ; D. W. S. Kaye, King's Coll. Hosp. ; H. J. Krichefski, Univ. Coll. Hosp. ; S. C. H. Lane, Guy's Hosp. ; A. J. C. Latchmore, Univ. of Leeds ; I. B. Limbery, St. Thomas's Hosp. ; G. H. Livingstone, King's Coll. Hosp. ; W. S. McConnell, Guy's Hosp. ; J. V. Macgregor, Univ. Coll. Hosp. ; M. L. Mistri, Guy's Hosp. ; Anna P. Montgomery, Charing Cross Hosp. ; Jocelyn A. M. Moore, L.S.M.W. ; Joyce Morgan, Westminster Hosp. ; D. T. R. Morris, Univ. Coll. Hosp. ; C. B. Nicholson, Middlesex Hosp. ; C. G. MacM. Nicol, Charing Cross Hosp. ; C. G. Paine, St. Mary's Hosp. ; Keren I. Parkes, King's Coll. Hosp. ; G. C. Pether, Middlesex Hosp. ; A. P. Petigura, Univ. Coll. Hosp. ; C. B. Picken, Guy's Hosp. ; Betty J. W. Pilsworth, L.S.M.W. ; G. L. S. Plumbly, Univ. Coll. Hosp., H. W. A. Post, Guy's Hosp. ; Israel Preiskel, St. Bart.'s Hosp. ; K. H. Pridie, Univ. of Bristol ; E. I. Puddy, St. Mary's Hosp. ; W. G. Richards, St. Thomas's Hosp. ; Marjorie E. Roberts, L.S.M.W. ; I. M. Robertson and R. D. Robinson, St. Bart.'s Hosp. ; Janet M. Rocke, L.S.M.W. ; A. P. Ross, King's Coll. Hosp. ; A. S. D. Russell, St. Thomas's Hosp. ; Beatrice A. Savill, King's Coll. Hosp. ; J. E. Schneider, St. Thomas's Hosp. ; E. M. Sharples, D. Shaw, and C. G. Sinclair, St. Bart.'s Hosp. ; Namasivayam Sinnadurai, Middlesex Hosp. and Ceylon Med. Coll. ; E. J. J. Smith, St. Bart's. Hosp. ; P. A. M. Soutter, Westminster Hosp. ; J. B. Sugden, Univ. of Leeds ; A. R. Thompson, London Hosp. ; F. S. Thornton, St. Thomas's Hosp. ; Decima M. Tracey and Frances J. Vinter, L.S.M.W. ; Nora W. Wamsley, Charing Cross Hosp. ; A. J. Watson, Middlesex Hosp. ; S. A. Wickramasinghe, Ceylon Med. Coll. and St. Bart.'s Hosp. ; Philip Wiles, Middlesex Hosp. ; W. A. Wilson, Univ. Coll. Hosp. ; Arthur Wiseman, Guy's Hosp. ; E. A. Wood, Univ. Coll. Hosp. ; Joyce R. Woods and Mary Worthington, L.S.M.W. ; T. C. Yip, St. Bart.'s Hosp ; and B. A. Young, Univ. Coll. Hosp.

The following candidates passed in the undermentioned parts of the examination :—

Group I.—Ellen M. Barnes, Univ. Coll. Hosp. ; J. N. Bhada, Univ. Coll. Hosp. and Grant Med. Coll., Bombay ; C. V. Bloom, London Hosp. ; W. E. R. Branch, Univ. Coll. Hosp. ; Eileen A. Chennell, St Mary's Hosp. ; Mabel J. Cooke, L.S.M.W. ; W. V. Cruden, St Bart.'s Hosp. ; Catherine Day, L.S.M.W. ; R. F. Fidler, Middlesex Hosp. ; Alice E. N. Gilby, L.S.M.W. ; D. R. Griffith, St Thomas's Hosp. ; Ernest Grundy, Univ. of Leeds ; F. R. Gusterson and G. F. Harrison, St Thomas's Hosp. ; E. F. Hewlitt, Guy's Hosp. ; J. F. L. King, St. Bart.'s Hosp. ; George Lee, St. Thomas's Hosp. ; Dorothy M. Lufkin, Univ. Coll. Hosp. ; Dorothy F. McIntosh, Charing Cross Hosp. ; T. H. Negus, St. Thomas's Hosp. ; A. T. Pagan, St. Bart.'s Hosp. ; L. M. J. A. Pilot, St. George's Hosp. ; J. C. Saldanha, Univ. Coll. Hosp. ; C. P. Scott, St. Thomas's Hosp. ; Mary Scouloudi and Mary E. Sharp, Univ. Coll. Hosp. ; Rupert Shelley, St. Thomas's Hosp. ; A. G. Signy, Guy's Hosp. ; Marjorie V. N. Sudds, L.S.M.W. ; K. G. Sugden and C. B. V. Tait, St. Bart.'s Hosp. ; and L. E. Vine, Univ. of Bristol.

Group II.—A. M. Boyd, St. Bart.'s Hosp. ; Bertha A. Briant and Lilian P. Edwards, L.S.M.W. ; H. K. Evans, Middlesex Hosp. ; Rees Evans, Univ. Coll. Hosp. ; B. M. Fonseka, Middlesex Hosp. ; Ruth C. Galletly, L.S.M.W. ; V. F. Hall, King's Coll. Hosp. ; Margaret L. Hamburger, L.S.M.W. ; G. B. M. Heggs and R. A. King, St. Mary's Hosp. ; K. E. Lane, Guy's Hosp. ; L. P. E. Laurent, Univ. Coll. Hosp. ; Arthur Levy, St. Thomas's Hosp. ; F. J. G. Lishman, E. W. Martindell, and Ralph Oliver, Univ. Coll. Hosp. ; Raymond Purvis, St. Thomas's Hosp. ; Sylvia M. Ransford, L.S.M.W. ; J. A. Robson, St. Bart.'s Hosp. ; R. C. N. Shires, Univ. of Leeds ; W. D. Steel, Univ. of Birmingham ; S. A. Underwood, St. Mary's Hosp. ; E. M. Wijerama, Ceylon Med. Coll. and Univ. Coll. Hosp. ; and N R. W. Wynn-Williams, Middlesex Hosp.

L.S.M.W. = London School of Medicine for Women.

UNIVERSITY OF CAMBRIDGE.—At a congregation on June 8th the degree of Bachelor of Medicine was conferred on *Robert Gallimore*.

UNIVERSITY OF DURHAM.—On the occasion of the installation of the Duke of Northumberland as Chancellor of the University, the honorary degree of D.C.L. was conferred on, amongst others, Sir John Rose Bradford, P.R.C.P., and Lord Moynihan, P.R.C.S.

ST. MARY'S HOSPITAL DINNER.—The annual dinner of past and present students of St. Mary's Hospital, London, will be held at the Trocadero Restaurant, Piccadilly-circus, on Friday, Oct. 4th, with Sir John Broadbent in the chair.

ST. BARTHOLOMEW'S HOSPITAL.—Mr. Grey Turner, professor of surgery in the University of Durham, is taking charge of the teaching in the surgical unit of St. Bartholomew's Hospital, in place of Prof. Gask, for a fortnight from June 10th to 22nd. On former occasions Prof. Harvey Cushing, of Boston, Prof. Hugh Cabot, of Ann Arbor, and Lord Moynihan have acted in a similar way.

ROYAL SANITARY INSTITUTE.—A sessional meeting will be held at Newcastle-upon-Tyne on Friday, June 21st, at 2.30 P.M. Among the speakers will be Dr. Glen Davison, Dr. Farquhar Murray, Dr. Harvey Evers, and Dr. Leonard Hill, F.R.S.

STRANGEWAYS RESEARCH LABORATORY, CAMBRIDGE. A course of instruction in the Technique of Tissue Culture will be given from July 9th to August 10th. Only a limited number of applicants can be received, and those wishing to take the course should send their names not later than June 30th, to Dr. H. B. Fell, at the Laboratory.

SOCIETY FOR THE STUDY OF INEBRIETY.—At a meeting of this Society at 11, Chandos-street, London, W., on Tuesday, July 9th, at 4 P.M., Mr. W. McAdam Eccles will deliver a presidential address on Some Gaps in the Study of Inebriety, and Sir William Willcox will open a discussion on the Toxic Effects of Methylated Spirits and Impure Forms of Alcohol.

POST GRADUATE COURSE AT CARLSBAD.—The eleventh international medical post-graduate course, with special reference to balneology and balneotherapy, will be held at Carlsbad from Sept. 15th to 21st. Medical men from many European countries are to give addresses, and reduced fares will be granted on the State railways of Czecho-Slovakia. Further information may be had from Dr. Edgar Ganz at Carlsbad.

NATIONAL ASSOCIATION FOR PREVENTION OF TUBERCULOSIS.—The fifteenth annual conference of this association will be held at Newcastle-upon-Tyne from Oct. 10th to 12th. On the first day an address entitled "Tuberculosis on Tyneside, a Sociological Survey," will be given by Mr. Henry Mess, Ph.D., and will be followed by a discussion. Later in the proceedings, Dr. Edouard Rist, of Paris, will open a discussion on the Factors that Produce Pulmonary Tuberculosis ; Dr. William Brand will outline a Scheme of National Propaganda regarding Tuberculosis ; and Dr. A. H. Macpherson will speak on the Combined Treatment and Technical Education of Tuberculous Youths. Numerous other addresses will be given, full particulars of the meeting being obtainable from the Secretary at 1, Gordon-square, London, W.C.1.

ROCKEFELLER MEDICAL FELLOWSHIPS.—The Medical Research Council announce that on behalf of the Rockefeller Foundation they have awarded seven travelling Fellowships for the academic year 1929–30. These Fellowships are awarded to graduates who have had some training in research work either in the primary sciences of medicine or in clinical medicine and surgery, and who are likely to profit by a period of work at a chosen centre in America or, in special cases, in Europe before taking up positions for higher teaching or research in the British Isles. The *new Fellows are:* Olive Burton Buckley, M.R.C.P., of King's College Hospital, London ; George Aleck Crocker Gough, Ph.D., of the National Institute for Medical Research ; William Robert Henderson, M.B., of the Royal Infirmary, Edinburgh ; Donald Hunter, F.R.C.P., Assistant Physician to the London Hospital ; George Eric Lewis, M.R.C.S., of the London Hospital ; Moses Myer Suzman, M.R.C.P., of the College of Medicine, Newcastle-upon-Tyne ; and Janet Maria Vaughan, B.M., of University College Hospital, London. Dr. Gough's Fellowship is tenable at the University of Munich ; the others at centres in the United States. Dr. Lewis has been appointed on modified conditions while receiving emoluments from another source.

METROPOLITAN HOSPITAL SUNDAY FUND.—The total collected by this Fund up to date is about £45,000.

Mr. Arthur Greenwood, the Minister of Health, has appointed Mr. A. Nevil Rucker to be his private secretary, and Mr. P. N. R. Butcher to be his assistant private secretary.

WILLIAM MACKENZIE MEDAL.—This medal for original contributions to ophthalmology of outstanding merit has been awarded for 1928, by the custodians of the Glasgow Eye Infirmary, to Mr. W. S. Duke-Elder.

TERRITORIAL ARMY AMBULANCE CHALLENGE SHIELD.—Nine medical units competed for this on June 8th. It was won, for the second year in succession, by the 167th (City of London) Field Ambulance, who gained 333 marks out of a possible 400. The Runners-up Cup, presented by Lieut.-General Sir Matthew Fell, Director-General of the Army Medical Services, was won by the 170th Cavalry Field Ambulance with a total of 314 marks.

LIVINGSTONE COLLEGE.—Commemoration Day was held on June 5th at Livingstone College, Leyton, when the Bishop of Chelmsford presided over a large gathering. The thing for which the College stood, he said, was the need for instructing missionaries in the elements of medical law, first in order that they might take care of themselves, and, secondly, that in case of need they might be a real help to the people to whom they were going. The Rev. P. D. Robert and Mr. J. E. Ruddle spoke of the great value of the training they had received; Mr. W. McAdam Eccles spoke of the financial position of the College, which requires £270 before Sept. 30th in order to avert an overdraft; and a short statement was made by the Principal, who said that 24 students had entered this year, of whom eight were for the full session. Entrants in the last July course numbered 32, and 24 came for the "care of health" courses. A vote of thanks was proposed by the Mayor of Leyton, and seconded by Dr. L. E. Wigram.

CONFERENCE ON MATERNITY AND CHILD WELFARE. The fifth English-speaking conference on maternity and child welfare will be held at Friends House, Euston-road, London, N.W., from July 2nd–4th, with visits to institutions on the following day and a special post-graduate course for medical practitioners. The subjects of debate will include the care of the child between 1 and 5 years of age; the factors affecting the psychological welfare of children under 5; maternal morbidity; the holding of special V.D. clinics for women and children in connexion with maternity and child welfare departments; and methods of preventing undue delay in the out-patient departments of hospitals. A lecture on rickets will be given by Dr. Eric Pritchard on July 2nd, and a presidential address on the problem of abortion will be delivered on July 4th to the Maternity and Child Welfare Section of the Society of Medical Officers of Health by Dame Louise McIlroy. There will be numerous social functions, and the Child Welfare Travelling Exhibition of the National Council for Maternity and Child Welfare will be open daily at the house of the British Medical Association. Further particulars may be had from Miss J. Halford, hon. secretary of the National Association for the Prevention of Infant Mortality, at 117, Piccadilly, London, W. 1.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, June 18th.—5.30 P.M. General Meeting of Fellows. Ballot for election to the Fellowship.

THURSDAY.—5 P.M., DERMATOLOGY. Cases will be shown at 4 P.M.

FRIDAY, June 21st.—8 P.M., OBSTETRICS. Specimen: A Gigantic Fœtus. Shown by Dr. Lawton Moss. Cases Two Cases of Adenomatous Tumour of the Vulva. Shown by Mr. A. J. Wrigley. Short Communication: Mr. G. F. Gibberd: The Use of Animal Bladders for the Iuduction of Premature Labour. Further notes on Difficult Labour in Australian Aboriginal with Postmortem Measurements of the Pelvis, by Prof. Cleland and Drs. Dawson Wallace and Hackett. (Adelaide). Paper. Mr. C. D. Read and Mr. Frederick Roques: Some Results of the Surgical Treatment of Pelvic Endometriomata. OTOLOGY: Summer Meeting at Cambridge (Friday, June 21st, and Sat. 22nd). Papers: (2 to 4 P.M.) Mr. Lowndes Yates: The Evolution of the Sense of Hearing. Mr. J. S. Tucker: Localisation of Sound. Mr. Seccombe Hett, Dr. A. G. Wells and Dr. Murray Levick: Ionisation as a Treatment for Middle-ear Suppuration. (4.30 to 6 P.M.). Dr. Albert A. Gray: The Application of the Principles of Maximum Stimulation to Clinical Otology. Mr. G. Wilkinson: Demonstration of a Model Resonator Designed to Illustrate the Mechanism of the Cochlea.

SATURDAY.—OTOLOGY (*cont.*). Papers (9.30 to 11 A.M.): Mr. M. Vlasto: The Chorda Tympani Nerve. Mr. C. S. Hallpike: Some Observations on Bone Conduction. Mr. Alex. R. Tweedie: Demonstration of Apparatus for Control of Conversation Test. Mr. Norman H. Barnett and others will take part in the discussion. DISEASE IN CHILDREN: The Provincial Meeting will be held at Nottingham on Sat., June 22nd.

BIOCHEMICAL SOCIETY.

SATURDAY, June 15th.—11.45 A.M. (at the John Innes Horticultural Institution, Merton, Surrey). Communications: H. W. Kinnersley and R. A. Peters: Observations on Carbohydrate Metabolism in Avitaminous Birds. E. Boyland; The Lag Between Phosphate Esterification and Carbon Dioxide Evolution in Alcoholic Fermentation. H. B. Stent, V. Subramanian and T. K. Walker; The Degradation of Succinic Acid by Aspergillus Niger. R. Scott-Moncrieff (introduced by J. B. S. Haldane): The Isolation and Identification of Some New Anthocyanins. E. Phillis: The Sugars of Tulip Bulbs. H. J. Channon and G. A. Collinson: Absorption of Liquid Paraffin From the Alimentary Tract of the Rat and Pig. T. Moore: The Association of Vitamin A Activity with Carotene in the Carrot Root. D. L. Collison, E. M. Hume, I. Smedley-MacLean and H. H. Smith. The Nature of the Vitamin A Constituent of Green Leaves. H. W. Dudley: The Isolation of Acetyl Choline from Natural Sources.

SOCIETY FOR CONSTRUCTIVE BIRTH CONTROL AND RACIAL PROGRESS.

THURSDAY, June 20th.—8 P.M. (Essex Hall, Essex-street, Strand, W.C.): Mrs. C. B. Hodson: Birth Control Clinics in the United States. To be followed by a discussion.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, Cavendish-square, W.

FRIDAY, June 21st.—8.15 P.M. (preceded at 7.45 P.M. by a Demonstration): Dr. J. F. C. Haslam: Some Health Problems of British Guiana. The Manson Medal will be presented to Sir Ronald Ross and the Chalmers Medal to Major A. C. Sinton, I.M.S.

LONDON CLINICAL SOCIETY.

THURSDAY, June 20th.—8.45 P.M. (at The London Temperance Hospital). Sir Humphry Rolleston: Medical Friendships, Clubs, Societies. (Third Annual MacAlister Lecture).

LECTURES, ADDRESSES, DEMONSTRATIONS. &c.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

MONDAY, June 17th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Ward Visit. 2 P.M., Mr. Donald Armour: Operations.

TUESDAY.—10 A.M., Medical Registrar: Ward Visit. 2 P.M., Mr. Addison: Operations. 2 P.M., Mr. Sinclair: Surgical Out-patients.

WEDNESDAY.—10 A.M., Dr. Owen: Children's Out-patient Department. 2 P.M., Mr. Tyrrell Gray: Operations. 2 P.M., Dr. Scott Pinchin: Medical Out-patients.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 11.30 A.M., Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. MacDonald: Genito-Urinary Out-patient Department.

FRIDAY.—10 A.M., Dr. Pritchard: Medical Ward Visit. 12 noon, Dr. Shaw: Clinical Demonstration. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Children's Medical Out-patient Department. 10 A.M., Resident Assistant Surgeon: Ward Visit. Medical and Surgical Out-patients at 2 P.M., daily. Operations. Special Departments daily, 10 A.M. to 5 P.M., Saturdays 10 A.M. to 1 P.M. Special Classes in Anæsthetics and Operative Surgery.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, June 17th.—2.30 to 5 P.M., Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M., Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M., Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M., Dental Clinics. 2.30 to 5 P.M., Medical, Surgical, Nose, Throat and Ear Clinics. Operations.

FRIDAY.—10.30 A.M., Throat, Nose and Ear Clinics. 2.30 to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.

NATIONAL HOSPITAL, Queen-square, Bloomsbury, W.C.

MONDAY, June 17th.—2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Collier: Polyneuritis.

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Grainger Stewart: Post-traumatic Neuroses. (1).

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Purdon Martin: Chorea.

FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic.

ST. PAUL'S HOSPITAL, Endell-street, W.C.

WEDNESDAY, June 19th.—4.30 P.M., Mr. R. H. Jocelyn Swan: The Examination of a Urological Patient.

UNIVERSITY OF SHEFFIELD POST-GRAUDATE CLINICS.

TUESDAY, June 18th.—3.30 P.M. (at the Jessop Hospital): Mr. Chisholm: Gynæcological Cases.

FRIDAY.—3.30 P.M., Dr. Yates: Late Complications of Head Injuries.

Appointments.

WOOD, GRACE H., M.B., Ch.B. Liverp., D.P.H., has been appointed Asst. M.O.H. for Bournemouth.

Mansfield and District Hospital: DAVIES, J. LLEWELLYN, M.B., B.Chir. Camb., F.R.C.S. Eng., Consulting Urological Surgeon; MALKIN, H. JORDAN, M.D. Lond., F.R.C.S. Edin., Consulting Gynæcological Surgeon.

Vacancies.

For further information refer to the advertisement columns.

Albert Dock Hospital, Connaught-road, E.—Res. M.O. At rate of £110.

Bath, Royal United Hospital.—Asst. H.S. At rate of £100.

Belgrave Hospital for Children, 1, Clapham-road, S.W.—Asst. P. 50 gns.

Bolton Infirmary and Dispensary.—H.S. At rate of £150.

Bradford City.—Locum Tenens for Bacteriological and Pathological Work. 12 gns. per week.

Bradford, Royal Eye and Ear Hospital.—Jun. H.S. £120.

Brighton, Royal Sussex County Hospital.—Two Cas. H.S.'s. Each £120.

Cambridge, Addenbrooke's Hospital.—H.S. At rate of £130.

Canterbury, Kent and Canterbury Hospital.—Res. M.O. At rate of £125.

Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—Sen. and Jun. H.S. £120 and £100 respectively.

Chester Royal Infirmary.—H.S. to Ear, Nose and Throat Dept. and Cas. O. £120. Also H.S. £120.

Children's Hospital, Balaam-street, Plaistow, E.—Hon. Orthopædic S.

Derby, Guardian's Institution and Infirmary.—Second Res. M.O. £250.

Dewsbury and District General Infirmary.—H.S. £200.

Dreadnought Hospital, Greenwich.—H.P. Also H.S. Each at rate of £110.

East London Hospital for Children, &c., Shadwell, E.—Res. H.S. At rate of £125.

Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Anæsthetist to Nose, Throat and Ear Dept.

Essex, Administrative County of.—Asst. County M.O.H. £600.

Evelina Hospital for Children, Southwark, S.E.—H.P. At rate of £120.

Exeter, Devon Mental Hospital, Exminster.—Jun. Asst. M.O. £300.

Exeter, Royal Devon and Exeter Hospital.—Asst. H.S. At rate of £100.

Golden-square, Throat, Nose and Ear. Hospital, W.—H.S. £100.

Grange-over-Sands, Westmorland Sanatorium, Meathop.—Med. Supt. £800.

Great Yarmouth General Hospital.—Jun. H.S. £100.

Grimsby and District Hospital.—H.S. £250.

Grosvenor Hospital for Women, Vincent-square, Westminster, S.W. Hon. Gyn. Surg.

Harrogate Infirmary.—Jun. H.S. £100.

Hospital for Children, Great Ormond-street, W.C.—Part-time Jun. Cas. O. At rate of £150. Also Res. M.O. for Country Branch Hospital, Tadworth Court, Tadworth, Surrey. At rate of £250.

Indian Medical Service.—Recruitment of European Officers.

Kensington, Fulham and Chelsea General Hospital, 194, Finborough-road, Earl's Court, S.W.—Res. Cas. M.O. At rate of £100.

Leicester Royal Infirmary.—M.O. for V.D. Dept. £4 10*s.* per week.

Liverpool Eye and Ear Infirmary, Myrtle-street.—H.S. to Ophthalmic Dept. £100.

Liverpool Hahnemann Hospital, Hope-street.—Res. M.O. At rate of £100.

Liverpool University.—Jun. Lecturer. £300.

London, Administrative County of.—Principal M.O.H. to Pub. Health Department. £2000.

London Hospital, E.—Cardiographic Department. Paterson Research Scholar. £400.

London Fever Hospital, Islington, N.—Asst. Res. M.O. £250.

London Temperance Hospital, Hampstead-road, N.W.—Cas. O. At rate of £120.

Lowestoft and North Suffolk Hospital.—H.S. £120.

Macclesfield General Infirmary.—Res. H.S. £180.

Madras Medical College, Vizagapatam.—Prof. of Physiology. £630–£1080.

Manchester, Ancoats Hospital.—Part-time Asst. Pathologist. £150.

Manchester Northern Hospital, Park Place, Cheetham Hill-road. Jun. H.S. £100.

Manchester, Salford Royal Hospital.—H.P. Also Three H.S's to Special Departments. Each at rate of £125.

Manchester University.—Amy Henrietta Worswick Fellowship. £150.

Ministry of Health, Whitehall, S.W.—M.O. £600.

Oldham Royal Infirmary.—Three H.S's. to Special Departments. Each at rate of £175.

Oswestry, Shropshire Orthopædic Hospital.—Locum Tenens H.S.

Plymouth, South Devon and East Cornwall Hospital.—Res. Surg.O. Also H.S. At rate of £150 and £100 respectively.

Poplar Hospital for Accidents, East India Dock-road, Poplar, E. 2nd Res. O. At rate of £175.

Prince of Wales's General Hospital, Tottenham, N.—Hon. Asst. S. to Ear, Nose and Throat Dept.

Queen's Hospital for Children, Hackney-road, E.—Surgeon to Ear, Nose and Throat Dept.

Reading, Royal Berkshire Hospital.—H.P., Cas. and Out-patient O. Each at rate of £150.

Royal Free Hospital, Gray's Inn-road, W.C.—Clin. Assts. to Special Depts.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.P. At rate of £100.

St. Andrew's Hospital, Dollis Hill, N.W.—Hon. Surgeon for Ear, Throat and Nose Dept.

Sheffield, Jessop Hospital for Women.—Three Asst. H.S.'s. Each at rate of £100.

South Eastern Hospital for Children, Sydenham, S.E.—Asst. and Res. M.O.'s. At rate of £75 and £100 respectively.

South Shields, Ingham Infirmary.—Jun. H.S. £150.

Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S. £150. H.S. for Ophthalmic and Aural Departments. £150. Also Asst. H.P. £125.

Sudan Government Medical Dept.—Two M.O.'s. LE720.

Surrey County Council.—Asst. M.O. £600.

Swansea Hospital.—H.P. £150–£200.

Truro, Royal Cornwall Infirmary.—H.S. £170.

University of London.—External Examinerships.

Victoria Hospital for Children, Tite-street, Chelsea, S.W.—H.S. At rate of £100.

Warrington Infirmary and Dispensary.—H.P. At rate of £150.

West Riding of Yorkshire, C.C.—Temporary Pathologist. £700.

Willesden General Hospital, N.W.—Res. H.S. At rate of £100.

Winchester Royal Hampshire County Hospital.—Res. H.S. £150.

Weston-Super-Mare Urban District.—Part-time M.O.H. £600.

Births, Marriages, and Deaths.

BIRTHS.

MACKINNON.—On June 1st, at No. 1, C.O. Quarters, New-road, Woolwich, the wife of Major J. M. Mackinnon, R.A.M.C., of a son.

PEGUM.—On May 27th, at De Warren House, Northfleet, Kent, the wife of J. S. Pegum, F.R.C.S.I., of a daughter.

MARRIAGES.

NOBLE—KELSALL.—On June 4th, at St. John's Parish Church, Blackpool, John Innes Noble, F.R.C.S., to Phyllis Sara, youngest daughter of Mr. and Mrs. F. Kelsall, of "Newlands," Newton Drive, Blackpool.

SEDGWICK—GLOVER.—On June 8th, at Christ Church, Purley, Philip Giles Sedgwick, F.R.C.S., L.R.C.P., to Edith Mary, only daughter of the late Edward Glover.

DEATHS.

FAIRBANK.—On June 9th, at Moulsey House, Windsor, Sir William Fairbank, K.C.V.O., O.B.E., Knight of Grace of The Order of St. John of Jerusalem, for 45 years Surgeon and afterwards Honorary Surgeon to The Royal Household at Windsor Castle, aged 78.

HARDING.—On June 7th, at Eastbourne, Sir Charles O'Brien Harding, aged 70.

JOLLYE.—On June 3rd, at Brooklands, Hemel Hempstead, Arthur Dixon Jollye, M.D., aged 65.

LASH.—On May 28th, at Mundesley, Captain Henry Andrew Lash, M.R.C.S., L.R.C.P., (Hon.) Lieutenant-Colonel B.E.F.

MARSH.—On June 6th, 1929, John Hedley Marsh, J.P., surgeon, of Cumberland House, Macclesfield, in his sixtieth year. Interment, Saturday, at the Macclesfield Cemetery, at 2.30.

McHARDY.—On June 5th, at Broomfields, Nayland, Colchester, Dr. Caroline McHardy.

SHAROOD.—On June 3rd, at Rowlands-road, Worthing, Edward Julian Sharood, Deputy-Inspector-General, M.D., R.N., in his 91st year.

STEPHENSON.—On May 15th, 1929, at the Manor House, Grimsby, George Skelton Stephenson, M.D., J.P., aged 80.

THOMPSON.—On June 9th, in Dublin, Sir William John Thompson, M.D., F.R.C.P.I., aged 68.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NATIONAL COUNCIL FOR MENTAL HYGIENE.—The Council has addressed a letter to local authorities and other public bodies, drawing attention to the urgent need for improved facilities for the treatment of poor persons suffering from nervous or mental breakdown of a type which does not constitute insanity. The rich are able to go into nursing homes under specialist treatment, but little or no accommodation at present exists for patients whose means are small. In England and Wales two special hospitals, the Lady Chichester Hospital at Hove and the Maudsley Hospital in London, provide beds for such patients; but only one or two out of the large number of general hospitals make any special provision, and then only to a meagre extent. Poor patients have, therefore, usually to be sent to the observation wards of poor-law infirmaries; these are unsuitable for cases of nervous breakdown since all kinds of mental illness are nursed in the same ward. The Council urge that when submitting schemes to the Ministry of Health in regard to the administration of the new Local Government Act local authorities will provide for accommodation and treatment in the ordinary public or municipal hospitals of patients suffering from nervous breakdown and the early symptoms of mental illness in addition to any provision which may be made for more established cases in special hospitals.

Notes, Comments, and Abstracts.

SWISS SPAS.

By J. F. Halls Dally, M.D. Camb., M.R.C.P. Lond.,

PHYSICIAN TO THE MOUNT VERNON HOSPITAL,

From remote times the health-restoring properties of the mineral and thermal springs of Switzerland have been widely appreciated. The Romans made considerable use of them, and later their benefits were exploited by various religious communities, who bequeathed many pretty legends anent the discovery of certain sources. Very quaint are some descriptions of early methods of bathing, such as being lowered by ropes through crevices in the overhanging rocks into dark and abysmal waters (Ragaz-Pfäfers), or of mixed bathing in ample and voluminous gowns whilst seated at floating trays on which meals were served (Loëche-les-Bains), or again of the "family bath" in which whole families would bathe together (Baden). The older equipment suggests a hardier—or more tolerant—race of invalids than that which visits the modern and luxuriously furnished baths, most of which are installed in the hotels, and in many cases in a private bath-room adjoining the bedroom.

Switzerland offers such a variety of scenery, climate, and opportunity for sport or excursion; its springs are so numerous, and its spas situate at such different altitudes in valleys, on plains or high plateaux, that the physician has little difficulty in selecting a spa which, whilst suited to the patient's complaint, at the same time will provide him with complete change and continuous interests. Although in brief compass it is impossible to give a detailed account of each, yet the following data may be helpful in indicating salient features of the various sources and the chief maladies for which they are found useful.

1. *Natural Strong Brine.*

Such waters are found at *Rheinfelden* (altitude 940 ft.), also at *Bex* (1410 ft.), and consist in a nearly saturated brine, applied generally and locally, with or without the mother-lye, as baths, compresses, external, rectal, and vaginal douches, gargles and inhalations, either (*a*) diluted, (*b*) undiluted, (*c*) as effervescent baths, by introduction of CO_2 under pressure, or (*d*) given internally with milk. In each place cold spring water is taken internally as a diuretic and to counteract slight constipation often induced by the brine.

Indications.—(1) Subacute and chronic rheumatism; septic arthritis; gout; traumatic atrophies and paralyses. (2) Diseases of children—recurrent and chronic catarrh, adenoids and enlarged tonsils, gland and bone tuberculosis; rickets. (3) Gynæcological disorders of puberty and the climacteric; pelvic inflammations; sterility and habit of abortion. (4) Cardio-vascular affections—post-infective myocardial disease; high and low arterial pressure.

2. *Sulphur Waters.*

(*a*) Strong. *Schinznach* (1050 ft.) has a daily output of 400,000 gallons of hot water, smelling strongly of sulphur, at a temperature of 91·7° F., from a cylindrical well some 9 ft. in diameter, the sulphur appearing as an iridescent film on the surface of the water, which is used as baths, irrigations, inhalations, and local applications. *Gurnigel* (3800 ft.) has strong H_2S water at a temperature of 50° F., also another spring containing little H_2S but more calcium sulphate. (*b*) Weak. *Baden* (1240 ft.) has a daily output of sulphur water in a volume of 200,000 gallons daily at a temperature of 116° F.

Indications.—Skin diseases, including eczema and psoriasis, but excluding syphilis; chronic rheumatism; slowly healing wounds and sinuses; respiratory catarrhs; gynæcological maladies.

3. *Thermal Waters.*

(*a*) Simple. *Ragaz* (1400 ft.) is a subalpine station with invigorating climate, beautiful scenery, a good golf course, and a large swimming-bath. Much benefit is ascribed to radio-activity maintained by constant flow of thermal water at 93° F. through all the baths.

Indications.—Arthritis; arterio-sclerosis; nephrosis; nervous exhaustion; multiple sclerosis (relief of spasticity); endocrine imbalance; hydræmia. Dilatation of heart and aorta, also high and low arterial pressures, are improved by specially designed continuous baths for the forearms and [illegible] at increasing temperatures.

[illegible] E[illegible]thy. *Loëche-les-Bains* (4630 ft.) combines a [illegible] high alpine climate with gypseous thermal Dr. A. [illegible]ons at 125° F. daily, permitting lengthy Treatmen[illegible] [illegible]800 ft.) in a sheltered valley of pines, Dr. Albert [illegible] of Maximum [illegible]mposition but less in temperature (78° F.) and quantity. A non-protein dietary is the special feature of this spa.

Indications.—Respiratory affections; metabolic excess; chronic renal and vesical inflammations.

4. *Chalybeate Waters.*

(*a*) *Disentis* (3450 ft.) nestles on an elevated plateau amid beautiful meadows and forests. Abundant fruit and vegetables are daily supplied at the hotel. Disentis is noteworthy in that it possesses the most powerfully radioactive spring in Switzerland (48 Maché units).

Indications.—Gout and rheumatism; cardio-arterio-renal affections; digestive disturbances; anæmia; weakness after illness and strain; neuralgias, particularly migraine.

(*b*) *Schuls* (4029 ft.), lying in a sheltered basin in the centre of the Engadine Alps, possesses waters with similar therapeutic properties, and in combination with the following adjacent spas has an abundance of mineral sources.

5. *Muriated Alkaline Sulphated Waters.*

Vulpera-Tarasp (3947 ft.), in the gorge of the river Inn, is the finest sulphate of sodium spa west of Austria. The waters of the Lucius and Emerita springs are strongly mineralised, with a high percentage of carbonic acid, lithium, and boric acid. The Bonifacius spring belongs to group IV., in that it is an alkaline chalybeate water.

Indications.—Diseases of metabolism; chronic infections and intoxications; circulatory, respiratory, and urinary affections.

The season at the above spas begins in the early summer and lasts until September, during which time the climate is equable and mild.

CRUISING IN LUXURY.

When Britain first (at Heaven's command) arose out of the azure main, it was, we may recall, on the distinct understanding that her inhabitants should be seafarers. And despite many subsequent changes of government the relics of a maritime tradition still linger in this country, so that every nice girl loves a sailor, and your true-blue Englishman thinks yearningly of the sea whenever he is given a holiday.

In these days, unfortunately, he thinks of a good many other things as well, such as sunshine, good company, foreign cities and people, athletic sports, comfortable chairs, bridge, drinks, and dancing; and it sometimes seems a little difficult to satisfy so many claims of intellect, imagination, and the senses—not to mention health. But modern industry is like the Slave of the Lamp. No sooner is a wish expressed than it is satisfied; and the pleasure-cruising steamer solves the problem of the ideal holiday for countless of our fellow-countrymen.

A ship of this kind, to quote from the literature of the subject, is like the sundial, which marks but the sunny hours; it carries no freight, it avoids the busy commercial ports, and it is primarily designed for the comfort of its passengers. The sightseer spends his days ashore without the bother of finding hotels or moving luggage; he is spared the irritation of travel, and when the day is over he can come back confidently to a clean and comfortable cabin, good service, good baths, clean clothes, and the hundred and one advantages of an established resting-place.

The Arandora Star.

In an attempt to produce the most perfect of cruising steamers the Blue Star Line have withdrawn their modern oil-burning vessel, the *Arandora Star*, from the South American service and have spent £200,000 in fitting her up for holiday purposes. Since she was already designed to take only first-class passengers it has been possible to reach a high standard both of elegance and luxury, and the representative of The Lancet who inspected her during a preliminary voyage from Greenock to London concluded that passengers who like this kind of life will find little to criticise in their accommodation or entertainment. The special suites are of course exceptionally comfortable, but the ordinary cabins are large and convenient, each having hot and cold running water, a radiator, an electric fan and forced draught ventilation for warm weather, and excellent mirrors and cupboards.

The adaptation of a ship of 27,000 tons displacement (15,000 tons gross) to the needs of only 350 passengers has made it possible to consider their comfort to an unusual degree. The large and beautiful dining-room has ample space for enough small tables to take the whole party at one sitting. The smoke-room, lounges, and ballroom are on the same scale; part of the deck has been enclosed for use in cold weather; there is plenty of room for games and walking; a gymnasium is provided on the boat-deck; and a swimming tank [illegible] to [illegible] [illegible]acious or perspiring.

[illegible] *the Crew.*

[illegible] [illegible]lls the dual civilisation [illegible] Machine." On the

f[illegible]

surface in the sunshine are the passengers in bright clothes, with no object but enjoyment, whilst in the bowels of the vessel lives a race which does the work and gets very little fun out of it.

The conditions offered by the merchant service, and the laws which govern them, still need drastic amendment, but the men's accommodation on board a modern liner such as the *Arandora Star* shows many signs of the improvement which is slowly taking place. A cruising steamer requires a very large staff of stewards, but here their needs have been met by converting space formerly used for cargo. A number of the senior ratings are fortunate enough to have two-berth cabins; in no case is provision made for more than 16 men in a single room; and at the time of inspection there was space to spare because the number of men in the larger cabins was considerably less than the number for which they were intended. All the men's quarters are fitted with forced ventilation and are lighted by electricity. Messrooms are provided for the sailors and engine-room staff, but the stewards get their food standing in the kitchens at the conclusion of the passengers' meals. These men work very long hours and do not get enough sleep or fresh air. The life of a steward, like that of many hotel servants, is generally recognised as unsatisfactory, and for remuneration they depend largely on gratuities from passengers. In common with everyone else employed on a cruising steamer they get little leave away from the ship, for the intervals between voyages are reduced to a day or two and the vessel is almost continuously at sea for some six months at a time.

A small number of bathrooms and showers, together with plenty of wash-rooms, and water-closets in single compartments, are available for the crew, and men coming off duty in the engine-room can reach their sleeping-quarters without going on deck. The ship contains a hospital with two 4-bunk wards, a bathroom, and a cabin for the sick-berth attendant. Passengers interview the surgeon in a consulting-room and dispensary which was under reconstruction when the visit was paid. An operating table is kept in reserve.

Holidays and Health.

The *Arandora Star* leaves London to-day, Saturday, on her first cruise, bound for the Norwegian fjords and Spitzbergen. Later in the year she will visit the Mediterranean countries. Holidays of the kind she offers are increasingly popular, but from the medical point of view they are conspicuously more suitable for some types of patient than for others. Medical men who hold no definite views on sea voyages will find much to interest them in a symposium on the subject in the *Practitioner* for March, to which a paper is contributed by Dr. W. Hamilton Allen, the surgeon of the *Arandora Star*. We take this opportunity of conveying our thanks to Dr. Allen for the kindly consideration shown to our representative, and also to the chief officer and second engineer for courteously placing their time at his disposal.

THE VEGETABLE KINGDOM AND THE PUBLIC HEALTH.

On May 31st Mr. H. V. Taylor gave a Chadwick Public Lecture on this subject to a large audience in the Chelsea Physic Garden, with Sir William Collins in the chair. Since people had taken to living in such great numbers in cities, he said, horticulture had become of much greater importance, its extension in the last 20 years having been phenomenal. Among garden products the tomato, like the potato, had originally come from South America. It required water and steady warmth. Cheap glass and a method for the precise regulation of temperature had made it possible to grow tomatoes under glass all the year round. This country was largely supplied from the Channel Islands, and also from the Canaries, where farming land otherwise worth £10 an acre might let for £150 per acre if it was suitable for growing tomatoes. The annual consumption of this vegetable in Great Britain was 3¼ million cwt.

Potatoes first came from a tableland in the Chilian Andes, and it seemed that whoever brought them to Europe, it was not Sir Walter Raleigh; in fact there was a statue in Germany to Sir Francis Drake as the introducer. Considerable prejudice against this crop had been aroused when it was first brought to Europe, and in France their dissemination was only secured by guile. Parmentier got a guard of soldiers from the King for his experimental field by day, and as he expected, the neighbours raided his field by night when the soldiers had gone away, and found his treasured plants valuable to them, so that the prejudice ceased. The new crop was so satisfactory that people came to rely too much upon it, and in 1845, when the potato blight appeared in Ireland and wrecked the year's crop, ten million pounds' worth of other foodstuffs were not enough to replace it. People did not agree, said Mr. Taylor, about the potato's most desirable qualities. In Ireland and Scotland a potato was wanted which in cooking turned into a dry flour; the favourite in England was the King Edward, which in Ireland they regarded as only fit for pigs. In Belgium and France they liked a yellow waxy variety that contained protein as well as starch. The annual consumption in this country was 2 cwt. per head.

Turning to apples the lecturer recalled how a grower from Ribston Priory found in France an apple he liked, pocketed the seeds, tried them in Yorkshire on his return, and grew the Ribston pippin, from which Cox later developed the best of all apples, Cox's orange pippin. Oddly enough, this apple was not appreciated in France. The apples of commerce now appeared all the year round, but there were early disappointments. Apples brought from Australia used to develop "brown heart," which was thought to be a disease, until it was realised that apples were alive and required to breathe, though less fresh air was needed if they were kept cool. At home 3 million cwt. were grown annually and 7 million were now imported. It was estimated that each person in this country ate 100 apples, 72 oranges, and 30 bananas every year.

Oranges came mostly from Spain, Palestine, California, or South Africa, the demand was steadily increasing and was supplied at all seasons. The navel orange resulted from no pollination, and similarly apples and grape-fruit could be grown without seeds, but the flavour suffered. Bananas were composed mainly of starch when green and might then be cooked like a potato, but as the banana ripened the starch turned to sugar. They grew chiefly in Jamaica and Central America and did not need to have the ground cleared for them, for once the timber was removed, the banana plants planted among the residual brush would clean the ground for themselves. It was in 1901 that Sir Alfred Jones, inspired by Mr. Joseph Chamberlain, began importing bananas from Jamaica, and the banana trade had now a volume of £7,000,000 a year.

Why, Mr. Taylor asked, had these fruits and vegetables become so popular of late years? Was it for their flavour or because they supplied some hidden need? They had little food value, most of them, though they furnished roughage, giving bulk to food. They also furnish vitamins, especially the tomato which was unusual among vegetables for its large content of vitamins A, B, and C. The orange provided chiefly the antiscorbutic vitamin C, and when in 1916 there was a shortage of potatoes in Scotland and in Manchester, scurvy developed. Further there were the salts of the fruit juices, of whose benefits we were not yet well enough informed. Clearly the vast development of cities had made these vegetable supplies of importance to the public health.

"NON-INFLAMMABLE" CELLULOID.

In considering the danger of celluloid in connexion with the Cleveland disaster we referred to the possibility of obtaining some less inflammable material with equally useful properties, and mentioned that the acetate of cellulose has replaced the nitrate in the preparation of plastic splints. It has come to light that an important recommendation to minimise the fire hazards of X ray films in this way appeared in an American paper[1] last year after a fire which nearly led to tragedy at the Memorial Hospital, Albany, N.Y. This fire arose, it is not known how, in a room on the first floor of the hospital used for the storage of films and X ray equipment the films being packed on shelves in ordinary cardboard boxes. Efforts to fight the fire were abortive, as the staff were forced back by the fumes from the burning films, and in retiring failed to close the doors between the corridor leading from the film-room and the open stairs leading to the upper floors, thus allowing smoke and fumes to permeate the building. In spite of all this occasion for disaster, no lives were lost. The paper, which is by Mr. R. D. Hobbs and is abstracted in the *Journal of the American Medical Association* for May 25th, deals with the methods of filing films so as to prevent the possibility of fire and contains the following significant passage:—

> "There is another and easier way to control this situation, although an inspection of hospitals indicates that it has not met with popular favour. There is a so-called non-inflammable film, made by treating cotton with acetic anhydride and acetic acid, and producing the same result physically but with the danger removed. The coating is similar to the other, and it is used in the same way. The price of acetic anhydride makes the film a little more expensive. The non-inflammable film is not unburnable as the name implies, but it is as safe as paper and rags, if not more so, for although its point of ignition may be a little lower than the others, its rate of burning is less, and, therefore, the spread of the flame is slower without the production of dangerous gases. It is unnecessary to require any storage conditions for celluloid acetate films; therefore this offers an easy solution to the entire problem when a hospital uses only one style of film."

Mr. Hobbs concludes with the remark that the chief objection to the use of the slow burning film is that it has a tendency to roll and is not so easily filed. Thus, he adds, property and lives may be endangered to facilitate handling and filing.

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[1] Modern Hospital, November, 1928.

THE SWISS MEDICAL YEAR BOOK.

AFTER appearing for 50 years in a modest paper cover and a format less than 6 by 4 inches, the Swiss Medical Calendar in its 1929 issue has blossomed into a handsome cloth-bound quarto volume which compares favourably with the medical directory of any other country. The preparation of this Schweizerisches Medizinisches Jahrbuch, 1929, as it is now called, has been undertaken by Dr. Felix Barth, of Basle, Dr. Otto Leuch, jun., of Zürich, and Dr. Hans Trüeb, of Berne, the first two being doctors of medicine, the last-named a doctor of laws. The general scheme of the book consists of a medical guide to each of the 24 cantons in succession, in which is given the personnel of the cantonal health department and of the various sanitary commissions, a list of the hospitals and asylums with their staffs, followed by a topographical directory of the practising doctors, apothecaries, dentists, and veterinary surgeons. At the end of this section there is an alphabetical index of all federal practitioners, whether doctors, apothecaries, dentists, dental technicians, or veterinary surgeons. In the medical list a particular sign denotes those who are *not* members of the Association of Swiss Doctors, the exceptions being surprisingly few. There is also a list of 45 Swiss doctors practising outside Switzerland, scattered, it may be noted, from Japan to Mexico; their number, if it is in any way complete, bears testimony to the reluctance of the Swiss to leave for long his native hills. Five of the absentees hold chairs—at Bonn, Frankfort, Leipzig, Stuttgart, and Johns Hopkins Universities. The rest of the year book is occupied with notes on medical societies and institutions, the various medical faculties hospitals, sanatoriums and the like, followed by an admirably illustrated account of Swiss spas and health resorts. Thus far the volume is no more than an excellent directory, but the earlier 131 pages are occupied by a collection of monographs and original articles of a very high standard. Leon Asher writes on the progress of endocrinology, M. Cloëtta and H. Fischer on progress in pharmacology, C. G. Jung on problems of modern psychotherapy, W. Löffler on progress in practical therapeutics, M. Lüdin on new X ray methods of examination, to mention only a few: while a series of obituary notices (which are to be developed further in subsequent issues) includes an admirable sketch of the life of August Forel by Alex. von Muralt. The year book is published by Benno Schwabe and Co. in Basle at 11 Swiss francs.

SECOND-CLASS LIVES.

IT is a commonplace to those familiar with medical examinations for life insurance that to express an opinion on what are called first-class lives is easy enough. To assess the second-class or substandard life is a more difficult matter and yet one of the utmost importance to the various companies. Dr. Jehangir J. Cursetji, whose "Pocket Guide to Medical Life Assurance" has already been noticed in these columns,[1] has now compiled a pamphlet entitled "Substandard Lives and their Assessment in Life Assurance."[2] The author, who is the medical director of the Oriental Government Security Life Assurance Company, has a great experience of this class of life. He offers as a definition of a second-class or substandard life "one whose health and general condition are fairly good but who suffers from some disabling factor or "weak spot" in his personal or family history which exposes him to a certain amount of risk tending to shorten his probable expectation of life." With this definition as a working basis it is possible to evolve a classification of the different factors presented by substandard lives. After a chapter of introductory remarks the author considers the various systems and organs in which defects may be present. On such matters as cardiac murmurs, raised blood pressure, and rapid pulses, for example, in the section on the heart, he lays down elementary and commonsense principles based upon modern work which are essentially sound and easy of application. The difficult question of tuberculosis in the antecedents of a person presenting himself for life assurance is clearly discussed, but the author finds himself unable to recommend for adoption in India the more favourable views on the prognosis of tuberculosis gleaned from recent literature in America and in this country. On albuminuria he steers a clever middle course, taking into account all that is known about the orthostatic variety; as regards syphilis he is strongly of the opinion that even "cured" cases require careful "loading." An interesting sidelight in connexion with this disease is his observation, based upon large numbers of medical reports, that both an hereditary syphilitic taint and a personal history of syphilis are much less noticeable among Indian people than among the nations of the Western world. This excellent little book is to be incorporated in the next edition of the author's "Pocket Guide," and it will be a welcome addition, especially for the occasional examiner, to handbooks already of the first-rank.

A CASE OF ENURESIS.

To the Editor of THE LANCET.

SIR,—I am quite at sea with regard to a case I saw last week and wonder whether any fellow practitioner can help me. A professional man, 58 years of age, came to see me with a condition of occasional enuresis. The first time it happened was at 18 years of age, and since then at intervals of anything up to 12 months. There had been no "accident" for two and a half years up to last week, and he naturally thought himself safe, but now he is in despair. He is married, two healthy children, very active mentally and physically, and strong. No venereal history, one serious illness since pneumonia at 13 years of age, he smokes heavily, and is very abstemious. He has made notes and can associate it with nothing: it has happened in winter and summer, after an evening nightcap and without, on holiday, and in middle of hard work. He now wraps up scrotum and penis in two triangularly folded handkerchiefs and so saves most of the mess.

I am, Sir, yours faithfully,

June 10th, 1929. PUZZLED.

KING EDWARD'S HOSPITAL FUND FOR LONDON.

AT the annual meeting of this Fund on June 11th Sir Cooper Perry, chairman of the Radium Distribution Committee, presented a report on the allocation to various London hospitals of the radium purchased with £50,000 given for the purpose by Sir Otto Beit, F.R.S., last year. The procedure adopted was outlined in THE LANCET of March 9th (p. 511), and involves the loan of radium to approved hospitals for periods of one year. The present position is that specifications have been received for nearly the whole amount available. Specifications covering 3·405 g. have been approved, while others amounting to 0·595 g. are still under consideration. It will be some little time yet before any of the radium is actually in use at the hospitals, as the verification of the radium content of each container is a delicate and lengthy process. The detailed work in connexion with the allocation has been carried out by a subcommittee of the Distribution Committee, consisting of Dr. Eardley Holland (chairman), Sir John Rose Bradford, Sir Cooper Perry, and Mr. Leonard Cohen (hon. sec. of the Fund). Prof. Sidney Russ serves as a coöpted member. The committee's inquiries have brought home to them the great need for an increase in the supply of radium available for use in hospitals, and the advantages to be derived from the concentration of a large proportion of any additional supply in the hands of a central agency which can place it out on loan under conditions designed to secure its effective use. Loans of radium have been allocated to the following hospitals with medical schools: Charing Cross, 250 mg.; Guy's, Middlesex, and University College, 500 mg. each; St. George's, St. Mary's, and St. Thomas's, 150 mg. each. Other hospitals receiving loans are Prince of Wales's, Queen Mary's Hospital for the East End, Royal Northern, West London, Elizabeth Garrett Anderson, the Golden-square Throat, Nose and Ear Hospital, and the South London Hospital for Women, 150 mg. each; Central London Ear, Nose and Throat Hospital, Chelsea Hospital for Women, the Hospital for Women, St. Mark's Hospital for Fistula, and the Samaritan Free Hospital for Women, 100 mg. each; and the Marie Curie Hospital, 250 mg. The omission of certain important hospitals is accounted for by the fact that they were already found to have radium available or in prospect to supply the needs regarded by the committee as minimal.

THE AZUERO TREATMENT.

To the Editor of THE LANCET.

SIR,—Reports have been circulated in the lay press that the cures of paralysis of various kinds by the stimulation of certain (undescribed) zones in the nasal mucosa claimed to have been effected by Dr. Azuero, of Madrid, have been confirmed and repeated by other Spanish doctors. Since I have had numerous inquiries about this treatment I wish to say that Dr. Azuero has not made public his method, and that therefore no data exist on which his claims can be either confirmed or refuted. The public is in a state of exalted expectancy, and particularly liable to the influence of suggestion. In view of these circumstances I would suggest that no British physician should encourage any patient to seek this treatment. If, however, a patient desires to try it on his own responsibility, he should be advised to go direct to Dr. Azuero himself.

I am, Sir, yours faithfully,

A. G. GRAY.

Madrid, June 4th, 1929.

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[1] THE LANCET, 1927, ii., 1138.

[2] Obtainable from Oriental Life Assurance Co., Fort, Bombay. 1928. Pp. 66. 3s.

Croonian Lectures
ON
SOME CHEMICAL FACTORS IN THE CONTROL OF THE CIRCULATION.

Delivered before the Royal College of Physicians of London

BY H. H. DALE, M.D. CAMB., F.R.C.P. LOND., F.R.S.,
DIRECTOR OF THE NATIONAL INSTITUTE FOR MEDICAL RESEARCH.

LECTURE III.*

LOCAL VASODILATOR REACTIONS.—HISTAMINE (*cont.*).—ACETYL CHOLINE.—CONCLUSION.

Histamine: Its Significance in Certain Pathological Reactions.

IT is, I think, in the field of the abnormal, pathological reactions of minute blood-vessels, and of certain tracts of involuntary muscle, that the greatest change and clarification of our conceptions is effected by the definite knowledge now available concerning the normal presence of histamine in so large a proportion of the cells of the body, and the ease with which it is liberated by injury of their protoplasm.

Anaphylactic and Allergic Reactions.

At the time when the activity of histamine was newly discovered and under investigation, the rediscovery of experimental anaphylaxis in the guinea-pig, and the dramatically fatal character of the shock in that species, had aroused fresh interest in the physiological details of the reaction, as seen, with such remarkable superficial differences, in different animal types. The knowledge was then new, that an artificial product of protein digestion, the familiar "Witte's peptone," when injected into a vein of the normal dog and of the normal guinea-pig, reproduced in each the characteristic and contrasted symptoms of the anaphylactic shock; in the dog, the tensely congested liver, hæmorrhagic intestinal mucosa, collapse of the circulation; in the guinea-pig, asphyxiating contraction of the bronchioles, usually fatal before any pronounced direct effect on the circulation had shown itself (Biedl and Kraus).[1] It was natural, then, to suppose that the anaphylactic shock was due to liberation of a protein cleavage-product in the circulation, by digestion of the reinjected antigen When the action of so simple a substance as histamine was found to produce the principal features of the shock with their characteristic contrasts in the different species, it was again natural that it should be identified with this hypothetical, circulating anaphylatoxin by certain continental writers. To me the theory, in that form, never appealed. Certain features of the anaphylactic reaction, such as the loss of the coagulability of the blood and the multiple small subserous hæmorrhages, were missing from the effects of histamine but reproduced in the action of substances like the Witte peptone. Later the investigations of a number of observers, including my own, convinced me of the correctness of the view which attributed the symptoms of the anaphylactic reaction, not to the formation of a poison in the blood, but to the reaction between the antigen and a precipitating antibody located in the cell protoplasm (Dale).[2] This theory of cellular sensitisation still seems to me to fit the known facts of anaphylaxis, in its original sense of an acquired specific sensitiveness to a soluble antigen. On the other hand, it was clear that the location of the reaction in the cells did not exclude the formation of a poison by protein cleavage; this might take place in the cells, and might there, indeed, be more rapid and severe in its effects than if it occurred in the blood. Abel and Kubota[3] definitely suggested the intracellular formation of histamine, by protein digestion, as the cause of the anaphylactic symptoms, and as accounting for their similarity to those produced by histamine directly injected.

It seemed to me that such suggestions went beyond the known facts. There was, and there is still, no convincing evidence, either of an immediate protein digestion resulting from the union of antigen and antibody, or of the liberation of histamine itself in the enzymatic cleavage of proteins. I suggested, indeed, on the facts then available, that the puzzling resemblance between histamine effects and the symptoms seen in the anaphylactic reaction might as logically find its explanation in the reverse direction; the effects of histamine itself might conceivably be due to its producing such changes in the state of dispersion of the protoplasmic colloids, as could be assumed to take place in the intracellular union of antigen and antibody.

Our present knowledge seems to me to have rendered all such speculations superfluous and obsolete. Lewis, finding that a local anaphylactic reaction in the human skin presented the familiar "triple response" of the blood-vessels to a local injury, concluded that the union of antigen and antibody in the sensitised cells acted, like any other injurious stimulus, by releasing the preformed H-substance. Such a conception appears to me to fit all the known facts, and to make clear the meaning of many which were difficult to interpret on any other theory. It was difficult, on our earlier conceptions, to explain why, in each species, only those cells should apparently become sensitive to the foreign antigen, and react to its reinjection, which had normally a special sensitiveness to histamine. There is now no necessity for assuming such preferential sensitisation of the cells which participate in the overt reaction. Cells of other types may be assumed to contain the specific antibody, and, as the result of its union in their protoplasm with the foreign antigen, to liberate preformed histamine; but only those cells which, in each species, are sensitive to histamine will exhibit the physiological reaction to it. The effect thus produced, and constituting in each species the central symptoms which determine the general aspect of the anaphylactic shock, could arise in one of two ways. The histamine might be liberated from, or in the immediate neighbourhood of, the reacting cells; on the other hand, anaphylactic injury of the cells of some large organ, such as the liver, might liberate histamine into the general circulation in such quantity as to produce its effects in the body generally, and thereby to cause a histamine-response in cells which are not themselves sensitised to the antigen, but are reactive to histamine. These alternative processes can actually be traced as the central features in the shock, as seen in the guinea-pig, in the one case, and the dog in the other. In the guinea-pig, in which death is produced by contraction of the plain muscle of the bronchioles, isolated samples of plain muscle give a direct response to application of the antigen in high dilutions; the histamine, we must suppose, is liberated from, or in the immediate neighbourhood of, the reacting cells. Isolated plain muscle from the anaphylactic dog, on the other hand, gives no significant response to the antigen, and the blood-vessels in the perfused limb of such a dog are but weakly affected if the antigen is added to the perfusing fluid. Yet when the antigen is injected into the circulation of the whole anaphylactic dog there is a general vascular and plain-muscle reaction, strikingly similar to that produced by histamine. As Manwaring[5] first showed, and others have abundantly confirmed, the sensitisation of the dog to the antigen is almost limited to the cells of the liver. If this organ is completely excluded from the circulation, injection of the antigen into the blood stream has little or no effect, though histamine, under such conditions, produces its usual general effects on small blood-vessels and plain muscle. If the blood leaving the liver of an anaphylactic dog is perfused through other organs of a second, normal dog, production of the anaphylactic shock in the first dog causes the vessels and plain muscle of the second to show responses such as they give to histamine. In the dog, therefore, the specific anaphylactic sensitisation by antibody chiefly affects the liver cells; when these are injured, by the immune reaction occurring in their protoplasm, histamine which we know them to contain, is released in such quantities as to produce its effects not only on the liver-vessels but on the histamine-sensitive cells of the body at large.

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* Lectures I. and II. appeared in THE LANCET of June 8th and 15th respectively.

That these two types of reaction do occur in the guinea-pig and dog can hardly be doubted; but such actions of histamine, in the immediate neighbourhood of its release or distributed by the circulation, do not complete the picture of the anaphylactic reaction in either species. As I have already mentioned, the anaphylactic shock involves effects of a more injurious and lasting nature than any which direct injection of histamine can produce. A loss of the coagulability of the blood is a feature of the anaphylactic reaction in all species, but not of the reaction to histamine. It is an effect following acute injury of the liver cells by many poisons. The dog's liver, in the anaphylactic shock, becomes enormously distended with blood and lymph, the reaction being much more severe and persistent than that produced by the direct effect of histamine on the vessels of this organ. The injury, in other words, is a far more severe and disorganising one than would be necessary to produce a physiological release of histamine, and the loss of the coagulability of the blood would alone suffice to show that other constituents of the liver cells are in fact liberated. It is unlikely that the histamine, which the liver must pour into the general circulation under such conditions, will be free; it is more likely to be involved in colloidal complexes with the other cell constituents. Some of Manwaring's more recent experiments[6] suggest that such complexes involve the antigen, so that they are prevented, by some other kind of antibody, from producing the histamine action on other tissues of a dog which has been immunised to it; but the meaning of these observations is not yet perfectly clear.

The fact that in the guinea-pig, especially when death from the shock is delayed, the blood also shows a loss of clotting power, which histamine does not produce, may be taken as evidence that the liver is also involved in the injurious cellular reaction in this species. The occurrence of capillary hæmorrhages in the shock, which histamine again does not produce, may be taken to indicate that the vascular endothelium is itself sensitised to the antigen, and directly injured by the immunity reaction, in addition to being affected by release of histamine from other cells in its neighbourhood.

We may picture the anaphylactic shock, therefore, as the result of cellular injury, due to the intracellular reaction of the antigen with an aggregating antibody. Whether this is general, or localised in a particular organ, histamine will be released, and its effects will be prominent in the resulting reaction, imposing a general resemblance to the syndrome produced by histamine itself, on the symptoms seen in each species. The cell injury, however, is not limited to the degree required to produce a release of histamine, and involves other and more direct results. Such a conception is in accordance with all the facts as yet available, and it has the advantage of rendering intelligible, not only the striking resemblance between symptoms of the anaphylactic reaction and those produced by injecting histamine, but also the various and equally significant points of difference between the two syndromes.

Along precisely similiar lines we can explain the effects of the various "allergens" or "haptenes" on the subject of a natural or acquired idiosyncrasy. Whatever view be taken as to the similarities or differences between such conditions and artificial anaphylaxis, all certainly involve a condition of the cells such that a normally harmless substance is specifically injurious to them; in all cases the reaction to such specific injury involves symptoms like those produced by histamine, and for the reason that in all cases histamine is released by the injury.

Anaphylactoid Phenomena.

There is a large group of pathological reactions, some produced by natural infections and others by artificial injection of various substances into the blood stream in which groups of symptoms occur, more or less closely resembling those seen in the anaphylactic or allergic reactions. A large literature has grown up around the significance attributed to these resemblances. Intravenous injection into the guinea-pig of various chemically inert colloids and suspensions, with or without preliminary incubation with serum, produces symptoms showing a general similarity to those of the anaphylactic shock in that species. These facts have been used as the basis of more than one theory as to the cause of the symptoms of the anaphylactic reaction. When the symptom-complex is regarded as specific to anaphylaxis, the results of injecting some of these artificial mixtures are, indeed, so similar that the resemblance appears highly significant. When once it is realised, however, that any kind of general cell injury which leads to the release of intracellular histamine must be followed by symptoms of this type, this significance largely disappears. Hanzlik and Karsner[7] have surveyed the actions of a wide variety of agents, including organic colloids such as agar-agar at one end of the scale and ions of heavy metals at the other, the injection of which into the blood of the guinea-pig produces the "anaphylactoid" syndrome. It is perhaps significant that they find, as a common feature of the action of many of these, capillary embolism and thrombosis in the lungs. With the knowledge that lung tissue is peculiarly rich in histamine, and that the most prominent feature in the overt reaction of the guinea-pig to these varied substances is the closure of the bronchioles and consequent asphyxia, which histamine itself also produces in minute doses, it seems reasonable to look to the liberation of this substance from injured cells, of the lungs in particular, for that "common basis for the truly anaphylactic and the anaphylactoid reactions" in the guinea-pig, which Hanzlik and Karsner indicate as an aim of further investigation.

The matter, however, is not quite so simple as that. A number of chemically inert substances, when mixed and incubated with blood serum outside the body, impart to the latter the power of eliciting the anaphylactoid symptom-complex when injected intravenously. Such toxic serum does not itself contain histamine; it does not directly stimulate isolated plain muscle as histamine does; but from its effects when injected we obtain evidence of its directly injurious action on the blood cells and on the vascular endothelium (see Dale and Kellaway).[8] The effects, therefore, of injecting some of these foreign substances into the blood may be due to their direct mechanical injury of cells with which they come into contact, liberating histamine at various points by a process analogous to that causing Lewis's triple response of the skin vessels. Others, apparently by adsorbent action on the protein-lipoid complexes of the blood plasma, may cause these in turn to act as an injurious foreign substance, and may thus, at second remove, produce the histamine-liberating cellular injury. In the case of some substances, again, such as the artificial peptones, it may be difficult to decide to what extent they are acting directly, to what extent indirectly through cell injury. Witte's peptone, for example, has direct effects on plain muscle which suggest that it may contain histamine. The project of demonstrating the presence of that base in small proportions in such a complex mixture of peptides, by its actual isolation in a state of chemical purity, would, according to our experience with other materials, not be a very hopeful one. Short of this, Abel and his co-workers have put forward chemical evidence to justify the presumption of its presence. There are features of the action of such a peptone, however, which make it clear that this is not wholly due to histamine already present in it, but at least in part to an injurious action on the liver cells, like that seen in the anaphylactic shock, with ensuing indirect effects on other organs, and possibly also with some direct injury of endothelial cells outside the liver.

When once it is realised that symptoms having much in common can be produced, either by injecting histamine itself directly, or by injecting injurious substances which will cause its release in the body, you will appreciate the difficulty of disentangling the different parts of the total effect, in the case of a preparation which may contain both histamine and such other substances. It must be borne in mind, also, that general endothelial injury by itself, apart from the effects of histamine incidentally released, would directly produce a circulatory collapse having at least points of similarity with that produced by a toxic dose of histamine; so that again, in the case of some substances such as poisonous metallic ions, injected intravenously, it may be very difficult to decide what part of the total effect should be attributed to direct, irreversible destruction of the tone of the minute vessels, and what part to the secondary pharmacodynamic action of histamine released by the general cell injury.

These various considerations appear to me only to reinforce the suggestion that the syndrome of the anaphylactic shock has no special relation to that condition, and that the appearance of that syndrome, or of any of its constituent symptoms, as the result of any other kind of artificial intervention or natural, pathological process, does not warrant the presumption of a causal relationship or common basis, except in so far as general or local cellular injury is present in each case. A group of symptoms common to all these reactions is that which histamine will produce; and the release of this substance, from cells injured by a multiplicity of agents, would satisfactorily account for this common element in their effects.

Limitations of the Significance of Histamine.

If you have so far followed my argument, you will not suspect me, however, of suggesting that the liberation of histamine will by itself account for *all* the symptoms included in the group of phenomena which we have been considering. The point is of such importance that, at the risk of repetition, I must make it with more directness and emphasis. We have no justification for assuming that histamine is the only cell constituent which injury liberates. It is possible to imagine an injury so mild in degree, and so restricted to cells not concerned in the ensuing reaction, that only histamine might be liberated, or only its effects be visible. More severe injury, however, whether physical or chemical, local or general, might be expected to introduce other elements into the reaction; we have seen that it does so in the anaphylactic and anaphylactoid reactions; and it may do this, either by causing liberation of other and unknown cell constituents, or by directly affecting the physiological integrity of the endothelium of the reacting vessels. We may not know, in any particular case, which of these possibilities is the more important; but we do know that a fully developed, local inflammatory reaction involves much that histamine cannot reproduce, in the wandering of white and the leakage of red cells into the injured tissue, the thrombosis, and the resulting arrest of the circulation. Histamine can satisfactorily account for the evanescent response to mild injury, and for the initial physiological phase of the response to injury more severe in degree. As the reaction becomes frankly pathological, the effects of histamine fail more and more to fill the picture.

I can imagine that in some minds, and particularly in those accustomed to the detailed study of pathological blood-vascular reactions, this failure of the effects of histamine to cover the whole field may raise doubts of its real significance. On my own mind, which views the phenomena instinctively from the angle of physiology and pharmacology, the effect of this limitation is in the opposite direction. If histamine reproduced all the reactions to any kind or degree of cell injury it might merely be one of innumerable cell poisons producing a common set of vascular reactions, by liberation of an H-substance having no chemical relationship to any of them. That the action of histamine is not thus directly injurious, but a specific, reversible pharmacodynamic action on certain contractile cells, on which it acts in extreme dilutions, is to me a strong argument for its true, physiological significance, and for its identification with Lewis's H-substance. Its normal occurrence in living cells has now been chemically demonstrated in a wide range of tissues, and can be legitimately inferred from physiological tests in many others. I think that we have sufficient evidence for regarding it as the physiological agent of the relaxation of the tone of the small blood-vessels in response to irritation or injury of the tissues, whether local or general. Whether it is also concerned in the more strictly physiological relaxation of the minute vessels, in response to metabolic activity, the future may show; as yet we have no evidence of such a function.

ACETYL-CHOLINE.

I ask your attention now to the action of an entirely different type of vasodilator substance, which resembles histamine in certain features of its scientific history. The simple quaternary ammonium-base, choline, has long been known as a constituent of the tissues, where it enters into the constitution of the group of phosphatide lipins known as lecithins. Possessing an alcoholic hydroxyl, it can be esterified, and its acetic ester, acetyl-choline, was prepared by Nothnagel in 1894.[9] Like histamine, therefore, it was made in the chemical laboratory long before it acquired a physiological interest. Choline was already known to produce a depressor effect on injection into the mammalian circulation, when Reid Hunt and Taveau,[10] in 1906, observed that acetyl-choline produced the same kind of effect in about one-thousandth part of the dose. It had a choline-like action, but was a thousand times, or more, as active. Hunt and Taveau speculated on the possibility that such a substance might occur in the body, but found no evidence of it. At this stage they regarded its action as due to weakening of the heart-beat. My own interest in it[11] was first aroused, again as in the case of histamine, by the discovery of its presence in certain extracts of ergot, from which my colleague Dr. Ewins succeeded in isolating it.[12] On making a more systematic investigation of its actions on various organs, I was struck by the remarkable parallelism between its effects and those produced by stimulation of parasympathetic nerves. It showed an extraordinary instability when injected into the blood stream, presumably being hydrolysed with the liberation of the relatively inactive choline. Accordingly its parasympathetic effects were even more rapidly evanescent, as well as more powerful, than the sympathetic effects of adrenaline produced under like conditions. A striking feature of its action, and one in which the correspondence with parasympathetic effects appeared to fail, was the general dilatation of small arteries, produced by almost incredibly minute doses of this substance, not only in the areas receiving vasodilator fibres from parasympathetic nerves, but in organs such as the limbs, where the only known vasodilator nerve-supply to the arterioles was, and still is, that of the antidromic, axon-reflex mechanism of the sensory nerves. When Reid Hunt,[13] a few years later, confirmed this observation, of the predominantly vasodilator nature of the depressor effect of acetyl-choline in minute doses, he was struck with the resemblance, in character and distribution, between its effects on limb vessels and those produced by peripheral stimulation of the appropriate sensory nerve-roots. He was inhibited, however, from attributing any significance to the resemblance, by the observation that the effects of acetyl-choline were completely abolished by doses of atropine which left the antidromic effects unimpaired.

During more recent years the activity of acetyl-choline has gained interest in several directions. I had observed that, apart from its parasympathetic and vasodilator effects in minute doses, readily annulled by atropine, acetyl-choline, injected in larger doses after atropine, exhibited, like many other quaternary ammonium bases, a powerful nicotine-like action on ganglion-cells. This second aspect of the action of acetyl-choline has been found to extend to the production also of certain peculiar motor effects on voluntary muscle, which nicotine was already known to produce. Langley[14] had studied the slowly developed tonic contractions of frog's muscle, produced by applying nicotine, and Riesser[15] found that immersion of the muscle in dilute solutions of acetyl-choline produced similar effects. Heidenhain[16] had observed that the voluntary muscle of the dog's tongue, when deprived by degeneration of its motor fibres from the hypoglossal nerve, responded by a slow wave of contraction—he called it a "pseudomotor reaction"—to injection of nicotine into the circulation. Frank, Nothmann and Hirsch-Kauffmann[17] found that acetyl-choline, in relatively small doses, produced this contraction of the denervated tongue in a very striking form, and that other voluntary muscles, such as those of the limbs, became similarly responsive to acetyl-choline when deprived of their motor nerves. There was a tendency to speculate on these actions of acetyl-choline on voluntary muscle as implying a parasympathetic motor innervation, connected with tonus, in addition to the ordinary motor nerve-supply. Gasser and I,[18] however, were able to show, I think convincingly, that these effects of acetyl-choline on voluntary muscle were not directly related to its parasympathetic action, but were entirely concerned with that other aspect of its activity, which it shares with substances like nicotine.

Chemical Transmission of Parasympathetic Effects.

Two other lines of evidence which have lent new interest to the action of acetyl-choline concern its parasympathetic effects. Weiland,[19] working in the laboratory of the late Prof. Magnus in Utrecht, found that an isolated, sealed loop of rabbit's intestine, suspended in Ringer's solution, gave up to the latter a substance which stimulated rhythmic activity, when added to the solution in which another loop was suspended. Le Heux,[20] in the same laboratory, investigated the chemical nature of this substance, and succeeded in isolating choline. Testing the stimulating effects of pure choline on such isolated pieces of intestine, he found that it was greatly intensified if the warm saline solution, in which the tissue was suspended, contained acetates. He was led to suggest the formation of acetyl-choline in the tissue as a preliminary to the action of choline. In the same connexion we may note an observation made by Hoet[21] on the activity of such isolated loops of intestine. Magnus had found that part of the automatic rhythm of such a preparation was stopped by atropine, and had attributed it to choline. Hoet found that if, after the animal had been killed, but before the loop was detached from its natural connexions, the vagus nerve was strongly stimulated, this atropine-sensitive element in the rhythm of the subsequently isolated loop was much increased.

The clearest evidence, however, of the peripheral release, during stimulation of the vagus, of a chemical substance transmitting the characteristic effects of vagus impulses, has been provided by the work of Otto Loewi[22] and his co-workers on the frog's heart, and of others who have repeated and confirmed their results. In a series of publications from 1921 onwards they have built up an imposing structure of evidence, for the details of which the original papers must be consulted. Here I can only give the story in outline. Briefly, it has been shown that when an isolated frog's heart, containing a small volume of Ringer's solution, is subjected to inhibition by stimulation of the vagus nerves, a substance passes into the Ringer's solution which, on transference to another isolated heart, reproduces there the effects of vagus inhibition. In passing it may be noted that Loewi found, and others have confirmed the finding, that when the action of the sympathetic accelerator fibres in the vagus prevails, so that a stimulation of the rhythm replaces inhibition, an accelerator substance passes into the Ringer's solution. For the present, however, our concern is with the inhibitory vagus-substance and its properties. The quantities are minute, but the behaviour has been examined with great ingenuity. The substance is not free choline, though choline is present; for acetylation increases the activity, but not in nearly so high a proportion as it does that of pure choline. The activity of the "vagus-substance" can be annulled by treatment with a tissue esterase, and then not merely restored by acetylation, but increased beyond the original level.

Looking at the whole of the evidence, one fails to find any point of it which is incompatible with the supposition that the vagus substance is, indeed, a highly unstable and intensely active choline ester closely resembling acetyl-choline in its properties. The instability of such a substance would lead to the liberation of some free choline; so that, even if the substance were acetyl-choline itself, complete acetylation of the mixed residue would lead to the increase of activity in varying proportion, which is actually observed. The muscle of the frog's heart yields a similar substance to artificial extraction, even without vagus inhibition; but vagus inhibition, as a preliminary to extraction, increases the yield.

It should be noted that somewhat similar observations were made, many years before this recent series, on the mammalian heart. Dixon [23] observed in 1906 that the mammalian heart yielded to extraction a substance soluble in alcohol, and producing a muscarine-like inhibition when applied to the heart of a frog, and that the yield was greatly increased by stimulating the vagus up to the moment of extraction. The action of acetyl-choline was not then known, and Dixon's observation was not chemically developed. Later, with Hamill,[24] he gave a wider application to the conception, but no further evidence directly concerned with vagus action. A few years ago Plattner [25] made experiments of a similar kind, and, with the knowledge before him of the behaviour of Loewi's substance from the frog's heart, was able to obtain evidence of the presence of a similar substance in the mammalian heart, behaving like a choline ester, and increased during vagal inhibition.

Acetyl-Choline a Normal Constituent of the Body.

Altogether, then, there appeared to be a good body of evidence in favour of the view that the vagus produces its effects, not by direct passage of its impulses to the effector cells, but by liberation in relation to them of a substance having the effects associated with stimulation of the vagus, and in other respects having the properties of an unstable choline ester. Of the extensive series of choline esters which have hitherto been examined acetyl-choline stood out as unique in the possession of properties which would fit it for the rôle of the vagus substance. The temptation to assume the identification must have been experienced by many interested in this field of work. The chemical isolation and identification of the actual vagus substance, from minimal traces of material, was clearly not to be expected. To me it seemed that the one piece of evidence needed to justify such an assumption, and yet not wholly beyond credible attainment, was the discovery, in some organ of the normal animal body, of a substance having these physiological properties, its isolation and chemical identification. Less than a year ago the opportunity was presented to my colleagues and myself by a chance observation. In completion of our series of investigations on the distribution of histamine we were working on spleen extracts, using the spleens from freshly killed oxen and horses. Histamine was in due course isolated, in quantity sufficient to account for the type of activity which it represents. In addition to this, however, we found a surprisingly powerful action of the choline type. When we extracted the fresh organ with precautions learned by experience, this activity was sometimes of such intensity that, if due to choline itself, it would have meant the presence in the extract of some 20 to 30 g. of that base per kilogramme of spleen substance. Such a proportion was incredible, and a clue to the meaning of this activity was soon given, by the fact that it disappeared if the original extract, or its partially purified constituents, were exposed to an alkaline reaction. Chance had apparently presented us with an intensely active and unstable choline ester, naturally present in an animal organ, and in such proportion that the attempt to isolate it was a reasonable enterprise. The evidence, afforded by this instability to alkali, was reinforced and given very significant direction by the discovery that the extract lowered the arterial pressure, stimulated isolated intestinal muscle, and produced the abnormal, slow contraction of denervated voluntary muscle; and, further, that in each of these different actions it could be accurately matched against the same proportionate dose of acetyl-choline. The isolation and the chemical and physiological identification were completed by my colleague Dr. Dudley and myself only a few days ago, and we are able now for the first time to state that the substance is, indeed, acetyl-choline. The details of the evidence will be published shortly.

SOME PHYSIOLOGICAL IMPLICATIONS.

We do not suppose that the finding of acetyl-choline in the spleens of certain animals has necessarily any significance as regards that organ itself, or that its presence suggests its action as a true hormone. The extraordinary instability of acetyl-choline in the blood makes such a function highly improbable. We regard the identification as important, chiefly for the reason that acetyl-choline, which first came to notice as an artificial substance, and has hitherto been known only as such, or as a product of plant metabolism, and as having a remarkable action on certain animal functions when artificially applied, is now known to be a natural constituent of the animal body. Where we have evidence, then, in the animal body of a substance resembling acetyl-choline in all its detectable characteristics, but in quantities or under conditions which give slender hope of its chemical isolation, this new knowledge seems to me to create a strong probability that we are dealing with acetyl-choline itself, and not with some unknown substance having similar properties. It seems to me, further, that we obtain a powerful reinforcement of this probability, if we consider its bearing on the relation to one another of a number of hitherto disconnected physiological phenomena. I will endeavour to arrange them in a logical sequence.

In the case of the inhibition of the heart by the vagus the liberation of acetyl-choline in relation to the heart muscle seems to fit the known facts, including the annulment of both vagus and acetyl-choline actions by atropine. It would seem difficult, then, to suppose that the vagus produces its stimulation of intestinal movements by an entirely different process; but here we meet the first discrepancy, in the fact that atropine very readily annuls the effect on intestinal movements of acetyl-choline applied through the surrounding medium, but not the otherwise similar effect of vagus stimulation. This is a type of discrepancy which we shall meet several times. It must be frankly recognised, but I doubt whether it should be accorded the decisive significance, which some have been disposed to attribute to it. We do not know how atropine prevents the action of acetyl-choline applied to the cells from the surrounding fluid; and it may be that, in some cases, it is peripherally liberated by nerve-impulses in such an intimate relation to the reactive structures that atropine is relatively ineffective in hindering its action.

Proceeding a step further, if we accept the mediating action of acetyl-choline in vagus effects, it is difficult to imagine that other parasympathetic actions, such as the vaso-dilator effects of the *chorda tympani*, are produced by a different mechanism. We have here again the same discrepancy with regard to the action of atropine; but, on the other hand, the supposition that this vaso-dilator action is due to peripheral liberation of acetyl-choline brings an entirely different, and otherwise unrelated, set of phenomena into the picture. As long ago as 1863 Vulpian and Philippeaux[26] described a curious behaviour of the tongue muscle, when deprived, by section and degeneration of the hypoglossal nerve, of its normal motor nerve-supply. Peripheral stimulation of the chorda-lingual nerve, or of the *chorda tympani* alone, now caused a curious slow contraction of the voluntary muscle, lifting and rolling the tongue; whereas in the normal tongue such stimulation causes nothing but vaso-dilatation. Now we have already noted that, under the same conditions, the tongue muscle shows a new, abnormal sensitiveness to a group of substances having a "nicotine" action, among which acetyl-choline is conspicuous. On injection of acetyl-choline into the circulation the denervated tongue muscle responds with the same kind of long, slow contraction as it exhibits when the chorda-lingual nerve is stimulated. In the normal tongue, therefore, chorda-lingual stimulation and acetyl-choline injection produce only vaso-dilatation; in the denervated tongue both produce an abnormal tonic contraction of the voluntary muscle. The suggestion is inevitable, that, when the *chorda tympani* is stimulated, a substance is released at the periphery, normally concerned in the tongue only with parasympathetic vaso-dilatation, but capable of exciting the abnormal, slow contraction in muscle-fibres deprived of their motor nerve-supply. We now know one substance in the body, and only one, which could produce both these effects, and it is acetyl-choline.

One further step brings me to the point of most importance for the general subject of these lectures. In 1894 Sherrington observed that degeneration of the motor nerve-fibres to the muscles of the leg caused a new type of reaction. These muscles now responded by a slow, weak tonus-wave to stimulation of the sensory fibres left in the sciatic nerve. Here, again, we have seen that a new and abnormal sensitiveness of the muscle-fibres to acetyl-choline appears, at the same time as this abnormal reaction to peripheral stimulation of the sensory nerve-fibres. And again, in the sensory fibres, we are dealing with nerve-fibres the peripheral stimulation of which normally causes no discoverable effect but vasodilatation, closely similar in its character and distribution to that produced by acetyl-choline, and differing only in that, like that caused by the *chorda tympani*, it is insensitive to the paralysing effect of atropine. Again the suggestion is inevitable, that the vasodilatation produced by antidromic stimulation of sensory fibres, or by the axon-reflex through their terminal branchings, involves the liberation, in relation to the affected arterioles, of a substance causing normal arterioles to dilate, and exciting voluntary muscle, deprived of its motor nerve-fibres, to an abnormal, slow form of contraction. The only substance known to occur in the body, and producing both these effects, is acetyl-choline; and it is unique among all known substances, from any source, in its power of producing both.

There is yet another point of correspondence which is worthy of notice. Frank, Nothmann and Hirsch-Kauffmann,[17] who first described the action of acetyl-choline on the denervated dog's tongue, showed that its effect, and the similar effect of stimulating the chorda-lingual nerve, were both suppressed during the circulation of a moderate dose of adrenaline in the blood. This parallel annulment, of acetyl-choline effects on denervated muscle and those of vasodilator nerve stimulation, appears not to hold good for the cat's tongue; but according to Hinsey and Gasser[27] it does so for the "Sherrington phenomenon" in the cat's hind limb. This action of adrenaline is incompletely understood; Gasser and I concluded that in some way it prevented the access of acetyl-choline to the reactive structures in the denervated muscle. If this is a true conception, the similar interference of adrentaline with the effects of stimulating the nerves acquires a very direct significance.

The probability, created by these items of evidence, of the intervention in arterio-dilator effects of a peripherally liberated substance, which also stimulates denervated voluntary muscle, has not escaped previous recognition. Bremer and Rylant[28] hint at it, Hinsey and Gasser[27] suggest it as a definite possibility. With the knowledge now available, I am emboldened to give it precision, and to indicate acetyl-choline as the agent concerned. If this view is adopted, the local vascular reaction to stimulus or injury of the tissue, Lewis's "triple response," becomes, indeed, an interesting complex of pharmacodynamic effects. We have first the liberation of histamine from the immediately affected cells, directly causing vasodilatation of the minute vessels with which it comes into contact, and acting as a persistent stimulus to the sensory endings of the terminal axon-branching. So far we follow Lewis and the "H-substance." We must then further imagine that the nerve-impulses thus engendered, passing through the bifurcation to the ending of the collateral on the arteriole, there liberate, as the effective dilator, acetyl-choline. Such a conception may seem complicated; but in reality it makes for simplicity, in that it brings into coherent relationship a number of otherwise disconnected facts. The conception is, further, in harmony with the general tendency of neurological speculation to picture the intervention of a chemical agent, wherever an impulse conducted along a nerve-fibre becomes translated into excitation or inhibition of a cell, even at the synapses in the central nervous grey matter (cf. Sherrington[29]).

Other Possible Cases of Chemical Transmission.

For the autonomic system in general, this idea, that the arrival of nerve impulses at the peripheral endings may act on the effector cells indirectly, through liberation of a chemical agent, is not of recent origin. As long ago as 1904[30] Elliott suggested that the true sympathetic nerves might so act, by the liberation of adrenaline at their synaptic unions with plain muscle and gland cells. Such a conception is now supported, not only by analogy with parasympathetic effects, but by the direct observation, made by Loewi (loc. cit.) and confirmed by others, that the sympathetic, accelerator effect on the isolated frog's heart involves the liberation of an accelerator substance. We have no evidence, however, as to the chemical nature of this agent; and, likely as it may seem on general grounds, I think it would be rash to assume as yet, from the action alone, that adrenaline is the substance in question. The case made for acetyl-choline, as the transmitter of parasympathetic and sensory collateral vasodilator effects, is based partly on the chemical behaviour of the vagus substance, partly on the reproduction by the nerves of another aspect of its action, seen only on abnormal tissues, and quite unconnected with parasympathetic effects. There is no other such side to the action of adrenaline; and it remains a possibility that sympathetic nerves liberate peripherally another sympathomimetic agent, adrenaline being a special substance with properties fitting it peculiarly for the distribution of this type of action through the circulation. That other sympathomimetic substances may occur in the tissues is suggested by the effects of certain extracts recently described by Collip; but we have yet no knowledge of the chemical nature of the substance or substances concerned, nor any ground for connecting their existence with any known bodily function. Whatever be the nature of this suggested chemical intervener between sympathetic impulses and effector cells, it can serve only as the transmitter of centrally originated impulses. We have no evidence of any mechanism for the localised, peripheral release of adrenaline or of any substance acting like it; nor do we know of any normally functional peripheral-reflex mechanism concerned with sympathetic axons, or with nerves releasing any sympathomimetic agent. Broadly the contrast, indicated in an earlier lecture, appears to hold good; vasomotor effects, whether produced by nervous impulses or by hormones, are centrally originated and widely distributed, and are concerned with the upholding and mass-variation of vascular tone; vasodilator effects are largely, though not entirely, local reactions, chemically originated, and concerned with the finer adjustment of blood-supply to local requirements.

SOME GENERAL CONSIDERATIONS.

I have endeavoured in these lectures to put before you the evidence concerning the part played in the control of the circulation by four chemical agents in particular. I have restricted my attention to these, not only because I have, in different degrees, been personally concerned in the investigation of each, but because they seem to me to be the only ones of which our knowledge is yet sufficiently definite to warrant even provisional conclusions with regard to their normal functional significance. A large amount of evidence exists on the effects of extracts from various organs of the body, artificially injected, or applied to isolated preparations of cardiac or involuntary muscle. A great many of these data can, as yet, be regarded only as observations put on record for future interpretation. To take only one example, there is a large amount of evidence, among the prominent contributors to which Demoor[31] in Belgium and Haberlandt[32] in Germany may be mentioned, on the effect of extracts from the right auricle, or from the sino-auricular junction, on isolated heart muscle. The suggestion has been made that some of the stimulating or restorative effects of such extracts on the rhythm of this muscle may be due to the presence of histamine; it has also been denied. It appears to me that we have not yet sufficient evidence as to the chemical nature of the substances concerned, as to their normal liberation, or as to the manner in which their effects could be produced under natural conditions, to justify the assumption that such an extract contains a "heart hormone" or an "automatin." We really need a system of criteria or postulates, comparable to Koch's celebrated postulates dealing with the ætiological significance of a micro-organism—conditions which must be fulfilled before physiological significance is attributed to the effects produced by artificial application of an artificial organ, extract. There can be no hope, however, that any such criteria as could at present be suggested would be more generally applicable, or less liable to exception, than Koch's postulates have proved to be in their own sphere of application.

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THE MECHANISM OF FILARIAL PERIODICITY.

BY CLAYTON LANE, M.D. LOND.,
LIEUT.-COLONEL, I.M.S. (RETD.).

THE difficult problem of filarial periodicity has puzzled and fascinated many since Sir Patrick Manson discovered its existence 50 years ago in *Filaria bancrofti*. Any attempted explanation must not merely account for the fact that the embryos of some filariæ are present in the cutaneous blood at all hours, of others by day only, and of yet others by night only, but must explain the established observation that the microfilariæ of *F. bancrofti* are in some parts of the world almost completely absent from skin blood by day, but in others can be found there throughout the 24 hours. A reasonable explanation of the periodicity, or of the lack of it, in *F. bancrofti* is obviously the key to the whole matter, and to the consideration of that anomaly this note is essentially directed; unless otherwise stated it is to this species that reference is made.

Periodicity in *F. bancrofti* is evidently produced in one of two ways. Either there exists in the circulation a fixed or almost fixed filarial population which shelters in some internal part of the body during the day and reaches the cutaneous capillaries at night only, or parturition is so timed that microfilariæ enter the blood stream at night only. The latter alternative implies: first, simultaneous cyclical parturition, using the term with the same loose regard to exactness as occurs in the reference to simultaneous cyclical sporulation in the tertian or quartan malaria parasites; and, secondly, daily death of the cyclical brood. The former conclusion was that reached by Manson, and it has held the day almost completely ever since. It seems well to reconsider it now in the light of the further knowledge which has been added to the subject particularly by the four expeditions sent out by the London School of Tropical Medicine which Manson founded, and by Prof. F. Fülleborn[1] whose recent survey of filariasis constitutes so remarkable an aid to all who would study this infection that without it the writing of this note might well have continued to be indefinitely postponed.

If microfilariæ merely retire to deeper parts during the day, what are those parts? Manson's[2] answer lay in their distribution in the organs after death in a classical case which during life had exhibited a very exact nocturnal periodicity, as proved by numerous examinations made during the previous nine months. During this period microfilariæ had been shown to disappear from the cutaneous circulation about 8 A.M. The man killed himself with prussic acid about 8.30 one morning in 1897. From the subsequent findings Manson concluded that "Filaria nocturna during its temporary absence from the circulation is present in the larger blood-vessels, particularly the arteries . . . but that the majority are lodged in the blood-vessels of the lungs." Now true filarial periodicity is marked by a swarm of embryos in the skin blood at night with their complete or almost complete disappearance from it by day; the difference is usually striking. If these microfilariæ shelter predominantly in the lungs by day, post-mortem examination should find them there in swarms when death occurs by day and in negligible quantities when it occurs at night. The difference should be a striking one if such examination can, as has been held, form a basis for conclusions. There is, at least, one such comparison reported. In British Guiana, where *F. bancrofti* shows nocturnal periodicity, Anderson[3] examined two cases who died of the acute septicæmia locally known as abdominal filariasis, one having died by day and one by night. Taking into consideration counts of microfilariæ found in those organs only which were examined in both cases, the percentage of the total which was found in the lungs was 23 for the day-time death and 10 for the night-time one. This difference in no way represents the loss of microfilariæ from the skin which occurs by day; it does not support a pulmonary habitat; and, quite reasonably, might be considered as fortuitous. Regarding the suggestion that microfilariæ retire by day to the large vessels, it is essential to remember that these creatures have no means of fixation. That they should be able to maintain their situation in the aorta or carotid artery seems as impossible as that a man should keep his position swimming against the current half way down the Niagara Falls. Moreover, Fülleborn has recovered enormous numbers of microfilariæ in the heart's blood after death, when puncture during life had recovered no more there than were present at the same time in skin blood. The post-mortem finding in Manson's case is not then evidence of microfilarial habitat during life, so far as the arteries are concerned.

Fixation in the Capillaries.

Fixation in the capillaries presents no such physical impossibility, and it has been held that during the period in which they are absent from the skin, microfilariæ retain their position in deep capillaries such as those of the lungs, either actively or passively. A retention, passive so far as the embryos are concerned, implies that during the period of their disappearance from skin blood the lung capillaries contract and retain the microfilariæ within them. But this means that such contraction maintains itself only at night when there is infection with *F. loa* in Africa, must be absent day and night when there is infection with *F. perstans* in Africa or with *F. bancrofti* in Fiji, and must be present only by day when there is infection with *F. bancrofti* in India or British Guiana. The corresponding constrictor effect of mixed infections on these vessels is too harassing to think out. Accordingly Fülleborn holds that *Mf. bancrofti*, in countries where it shows periodicity, takes up by day a slightly bent attitude and by this means holds itself for hours in deep capillaries and precapillaries, much as does a rock-climber in a cleft on the face of a cliff. Now such a "ratchet-action" posture is a commonplace in hookworm larvæ, but seems never to have been noted in microfilariæ. It is surely inconceivable that a posture adopted by the embryo for hours at a time in blood within the vessels should be absolutely abandoned in drawn blood. Moreover, Manson[4] aspirated by day the spleens of two filarious patients with nocturnal periodicity and drew off no microfilariæ. A small quantity of hæmoptysis blood passed by day was equally negative. W. W. Myers,[5] too, had negative results from both liver and spleen punctures in like conditions. During life, then, no secret day-time haunt of living microfilariæ has ever been detected. Furthermore, if one may so put the matter, what biological necessity could possibly induce the embryo to take up for many hours of the 24 an attitude which, on the supposition that it is long-lived, is entirely purposeless? That is the actual position. If embryos are long-lived and have already reached the blood stream they merely need to circulate there passively day and night till they die or are picked up by a mosquito. That microfilariæ must be passing through the skin capillaries during the hours when the insect vector feeds is essential for the preservation of the worm species; but that long-lived embryos should take the trouble actively to keep out of the skin at hours when the vector is unlikely to feed can advantage them in no possible way unless the mere fact of circulating damages them. That suggestion cannot be accepted for, assuming that *Mf. bancrofti* survives more than 24 hours, then in Fiji it enjoys no such respite from battering, and yet P. H. Bahr[6] holds that every embryo which reaches the Fiji vector, *Aëdes variegatus* var *pseudoscutellaris*, probably proceeds to develop; Manson had shown that the periodic and presumably protected form in China enjoys no such vitality in culex. The conclusion, then, seems inevitable that the temporary withdrawal of the microfilaria by its own activity from the skin during the day would be a biologically purposeless waste of energy subserving in no way the survival of the species and constituting a happening presumably impossible under natural selection. Yet it was just the presence of periodicity which led Manson rightly to implicate the mosquito as vector. The connexion must be in another direction. Again, microfilariæ are notoriously active creatures, and on the analogy, admittedly incomplete, of hookworm larvæ which are markedly altered in appearance after prolonged exertion, it is unexpected to find a complete absence from microfilariæ of any reported change in this direction, provided always that they live for long periods.

If periodic microfilariæ do not normally inhabit the large vessels during the day, how is their presence there after death explicable? If, as is by analogy reasonable, the female filaria in a dying host is apt to empty her uteri of microfilariæ, these, passing through the thoracic or left lymphatic duct, must later be found exactly where they have so frequently been reported after death, but as has been noted, not during life—in the lungs and large vessels.

Cyclical Parturition.

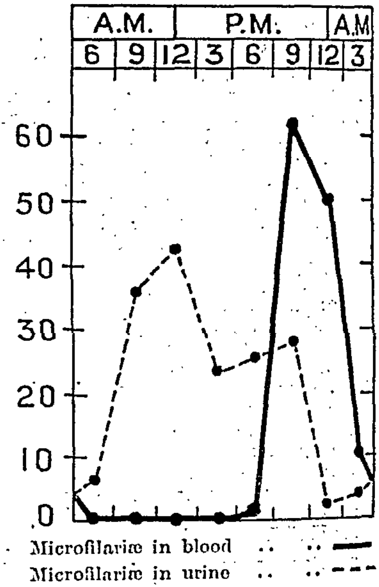
Passing to the possibility that periodicity in *F. bancrofti*, when it occurs, is an expression of parturition so timed that microfilariæ enter the blood stream at night only, it is clear that the necessary corollary is their complete destruction every day. The likelihood of periodicity by parturition was examined by Manson[4] in answer to certain observations by Myers.[5] Manson obtained and tabulated from the same man for six consecutive days and nights three-hourly counts of microfilariæ in smears of blood measuring 1½ by 1 in. and in the deposit from one ounce of chyluric urine. He then added together the counts from smears made at the same hour and wrote of the result: "If these figures are added together the results of this examination become more apparent. It seems to me that they indicate that filarial embryos are nearly always passing into the lymph stream. . . . Therefore filarial periodicity is independent of the act of parturition which is more or less a continuous process." The actual figures were as follows:—

Hour	6	9	Mid-day.	3	6	9	Mid-night.	3
Microfilariæ in—								
Blood	0	0	0	0	1	62	50	10
Urine ..	7	36	43	24	26	28	3	4

If this Table be plotted out it produces the accompanying graph which does not indicate a more or less even microfilarial content of the urine and so of the lymph. There did, in fact, exist urinary periodicity, marked though not complete, and timed differently to that of the blood. This is just what would be expected since, as P. A. Buxton[7] writes, "the larvæ which are counted in the blood come from a parent which is causing no physical signs," they take a direct and rapid route down the lymph stream into the blood stream. The larvæ counted in this case in the urine came from a female lying behind a grave lymphatic blockage. The lymph bearing them must have taken a devious, slow, and erratic course to the ruptured lymphatic vessel in the bladder, so that the curve showing microfilarial discharge must be a flattened one with its rise considerably delayed—such a one, indeed, as the chart shows to have been present in this case.

Direct evidence concerning cyclical parturition is scanty; faced with the adverse opinion of weighty authority few, perhaps, have cared or troubled to collect apposite evidence. Yet scattered observations support it. Bahr[6] in Fiji reported upon six full-grown female worms. Two of these were without embryos but with eggs, and measured 50 mm. and 67 mm. long, the latter, indeed, being the largest individual recovered, and clearly mature. Presumably, then, they had emptied their uteri of microfilariæ, and were waiting for their next cyclical parturition.*

Regarding their life span, he noted seven instances in which microfilariæ disappeared permanently from the blood while this was being regularly examined. In three cases this complete disappearance occurred within 24 hours of the onset of a febrile inflammatory reaction. Now Manson had noted, and O'Connor[8] has confirmed the observation, that mere fever does not cause microfilariæ to disappear from the circulation Bahr's observation implies, then, that the stream o newly born microfilariæ was abruptly cut off by the death or the complete inflammatory isolation of their mothers, and that those embryos already in the blood stream died within 24 hours. That the life span of microfilariæ in the body does not exceed a few hours is also suggested by another observation by Bahr. He found that in citrated blood they never survived for more than 12 hours at blood temperature, while his controls in the same citrated blood lived for three days at room temperature. Their survival at bench temperature for days is, of course, a commonplace, and is perhaps a necessity for survival in the mosquito.



Regarding the daily complete destruction of microfilariæ demanded by a simultaneous cyclical parturition which produces periodicity, microfilariæ have been injected into the blood of apes and have forthwith disappeared. Fülleborn[1] has, however, reported that *Mf. repens* injected into the dog has survived for two and three quarter years, and in one case doubled in size. These are biological unlikelihoods; and in connexion with larval longevity Myers[9] calculated, on the basis of Manson's investigations on *Filaria corvi-torquati*, that each female *F. bancrofti* poured 2,000,000 embryos into the blood daily. If these could survive for two years, the attempt to envisage traffic conditions in the blood and lymphatic vessels of a man parasitised by even a single female filaria for that period suggest that the term "unlikelihood" used above is a moderate one.

If microfilariæ are so short-lived, how are they disposed of? Evidence lies in two directions. Myers's[5] experiments, carried out with striking care and thoroughness, indicated that death and solution of microfilariæ (which showed periodicity and were evidently kept at the bench temperature of his China station) actually occurred in serum, and was much more rapid in morning than in evening blood. Manson[4] failed to confirm this, and the matter has evidently been dismissed as settled; but a positive finding from experiments as carefully executed as were those of Myers cannot be held cancelled by lack of confirmation from others carried through in unstated conditions. Moreover, this question of solution of microfilariæ can no longer be dismissed summarily as an irrelevance. Fleming's[10] showing—that 5000 million *Micrococcus lysodeikticus* are dissolved in a few moments by a tiny tear, and that the lysozyme which is the active principle concerned, and which is present in white of egg, still has lytic action when this last is diluted to 1 in 60,000,000—compels reconsideration of this matter.

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* The suggestion is that in these non-periodic filariæ parturition cycles of different females fail to be simultaneous.

Actual destruction of microfilariæ in the body itself has been observed by E. Rodenwaldt[11] and by Anderson.[3] The former implicated the renal medulla where he found disintegrating embryos so plentiful that Fülleborn refers to these organs as constituting a veritable microfilarial cemetery—as the place where dead and dying microfilariæ are eliminated from the blood. Anderson found in the liver and spleen, and apparently in the lymph glands, dead microfilariæ without striation and in process of dissolution. These records are few enough, yet the doctrine of periodicity by visceral filtration is so venerable and carries such a weight of authority that regular investigation into possible massive destruction of embryos has never been conducted, so that the fact that such a condition has not been regularly reported is no necessary evidence that it is not regularly taking place. The matter at least merits deeper study.

Biological Support.

But the consideration which appeals most strongly to the writer as supporting simultaneous cyclical parturition as the cause of periodicity is biological. Speaking generally, two typical mosquitoes serve *F. bancrofti* as intermediate host, *Aëdes variegatus* var *pseudoscutellaris* in Oceania where it bites mainly, but as O'Connor showed, not exclusively by day, and where the microfilaria is non-periodic, and the night feeder *Culex fatigans* elsewhere where the microfilaria is periodic and nocturnal. Both these insects Bahr fed on the same filariated patient in Fiji where microfilariæ are non-periodic. The work was a model of control. In *C. fatigans* the infection in the majority of insects died out altogether; in no instance were more than two developing filariæ found in the thorax of one mosquito after the seventh day. On *A. pseudoscutellaris*, on the contrary, it was deemed possible, as already mentioned, that all microfilariæ which had been imbibed had proceeded to continuous development; at all events as many as 38 were found in the thorax of one mosquito on the sixteenth day, and feeds from strongly infected blood caused so heavy an infection that the mosquitoes died. As a secondary host *A. pseudoscutellaris* is then many times more susceptible than *C. fatigans*.

The influence of this susceptibility on the worm species will be much as follows. Infected aëdes will die in thousands from filarial infection, but this is biologically immaterial to the filaria, since the number of vectors which survive is so great and the output of microfilariæ so prodigal that the species will be maintained with ease by those other mosquitoes who happen to become lightly infected. Even with a heavy human infection, mosquito infection may be light, either because the insect happens on a moment when the circulating blood contains few microfilariæ (Bahr has shown that the microfilarial content of the blood may vary in Oceania from minute to minute), or because it secures a small meal only. Should such filariæ be carried by the migration of their human host out of the relatively restricted area of this optimum intermediate host into that of *C. fatigans*, where an increase of the microfilarial content of the cutaneous blood at night is essential, then, if the species is to maintain itself by means of this inefficient "nurse" when the human host is lightly infected, no juggling by retention of microfilariæ in deep organs can add to their number in the skin and perpetuate the worm species in these new and difficult conditions. Just the reverse. But if the female worms, without altering the number of short-lived microfilariæ produced daily, can learn under some stimulus at present unknown so to regulate their already varying rate of parturition as to concentrate cyclically in the blood, the great bulk of these embryos during the few hours when *C. fatigans* bites, the worm species will survive even with this inefficient intermediate host. While this sequence assumes that Oceania is the original home of *F. bancrofti*, there seems, if it is worked out mentally in detail, no insuperable biological reason against the process having been the reverse. Yet an optimum insect host and an unspecialised type of parturition seem to be primitive characters. That the contrary has been commonly assumed is, perhaps, due partly to the prior discovery of the periodic form, and partly to the knowledge that the trend of the "Archaic Civilisation," as W. J. Perry[12] calls it, emanating probably from Egypt, travelled thence eastwards by India right across the Pacific. Yet these pioneers went out for commerce and brought back west and north gold and pearl shell. And just as later the European civilisation searching America for gold brought back the potato and syphilis, so is there good reason to believe did the Archaic Civilisation not only carry the taro plant from India into the Pacific and carry it back to Egypt, whence it has spread across Africa, but also, it is here suggested, transport *F. bancrofti* westwards. The direction of transport is, however, for the purpose of this note, relatively unimportant. The essential point is the insistence that the trend of evidence supports, as the mechanism producing periodicity in *F. bancrofti*, simultaneous cyclical parturition and daily massive destruction of microfilariæ.

Conclusions.

The conclusions reached regarding the mechanism of periodicity are these. *If the embryos of F. bancrofti*, when absent from the skin blood, harbour elsewhere, it is physically unthinkable that they should do so in the overwhelming current of the large blood-vessels; they accumulate in these in numbers from the lymph trunks at or after death only. Nor are they being held back from skin blood by contraction of visceral capillaries, since these can hardly close on one species and open for another circulating in the same blood at the same time. If it were their posture which maintained microfilariæ for many hours daily in deep capillaries, posturing would not be completely discarded in drawn blood. Living microfilariæ have never been found congregated by day in any deep capillaries in numbers corresponding in any way to those demanded by this hypothesis of the mechanism of periodicity; no secret retreat of theirs has been discovered. If they were long-lived, old should be distinguishable from young larvæ by visible changes induced by their activity. Periodicity, then, cannot reasonably be explained as being due to a changed distribution within the blood-vessels of long-lived microfilariæ. Moreover, such a condition holds no biological advantage for the species.

The known facts have a cumulative weight in favour of the hypothesis that microfilariæ within the body perish rapidly, at least daily, and that periodicity is the result of simultaneous cyclical parturition. It is by this device alone that, except in optimum circumstances, the species is enabled to survive. Periodicity, then, is not a mere adaptation to the feeding habits of a particular intermediate host. It is an adjustment which produces that mean between failure to infect an insect and liability to kill it by hyperinfection which reasonably subserves the survival of the parasitic species. It is suggested that contentment with present beliefs on present foundations is no longer possible, and that the whole matter needs reinvestigation with an open mind.

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PRIMARY GENERALISED HYPERTROPHY OF THE GUMS.

ILLUSTRATED BY A CASE.

BY D. PERKOFF, M.R.C.S. ENG.,
MEDICAL OFFICER, HOXTON MARKET CHRISTIAN MISSION.

THE entity of most rare conditions is difficult to establish and the case which I describe is no exception. Many authors, among them Grieg, Heath, Sleep, Parkes Weber, and Ironside, have pointed out the rarity of this condition. Heath says that the first case recorded in England was by S. J. A. Salter in 1859, occurring in a little girl aged 8 at St. George's Hospital under the care of Pollock.

Précis of Current Views.

There is some confusion in the literature about the existence of this condition as a separate entity from the rare unilateral hypertrophy of the gums which may be general or localised. The credit for giving us a clear picture is due to Grieg, who thinks that this form of hypertrophy does not constitute a disease, but an affection sui generis, a pure overgrowth of the gums, which is congenital, general, and bilateral, and only gives rise to discomfort after the eruption of the teeth, temporary and permanent alike. Many authors agree that the condition is congenital.

(*a*) Salter thinks it is congenital; although it occurs in children, it has never been known to occur at birth.

(*b*) Hutchison points out that the hypertrophy of the gums, in his case, preceded the appearance of the teeth which had never been able to force themselves beyond the gum surfaces; they were somewhat carious and would probably come out. If the condition were the result of sepsis of the gums or of pyorrhœa, one would expect it to be commoner. He compares it with macroglossia and—if the term were permissible—one could call it "gigantism of the gums."

(*c*) Sleep gives excellent reasons for assuming a congenital origin. He does not consider the lesions to be contingent on any exciting cause, but that the potentiality was contained ab initio in the germinal vesicle itself. As he says, "constitutional perversion is a developing force that precedes and accompanies the advent of the teeth germs from their genesis to their maturity." The teeth in his cases were normal in size and shape; there was no suggestion of any pathological process or excitement in the fœtal or infant life which might have induced hypertrophy of the formative epithelium constituting the enamel organ, or the submucous tissue of the papillæ forming the dentine. He therefore correctly infers that the aberrant process underlying the disease may precede the advent of the dental organs and grow with it and that they should not be suspected as the possible causes of the disease, either by or through their mere presence.

(*d*) Allbutt and Rolleston, discussing the causes of hypertrophy of the gums, mention that generalised hypertrophy may be due to widespread dental disease, especially when the organisms and pus form in pouches between the teeth and the gums, as in pyorrhœa. They are careful, however, to notice that there is a deep-seated general hypertrophy which is congenital, although it may only be noticed at the first dentition. They say that it is necessary to shave off not only the gums but also the portions of the dental alveolus from which it grows. I have no doubt that these authors have in mind the conditions which we are discussing.

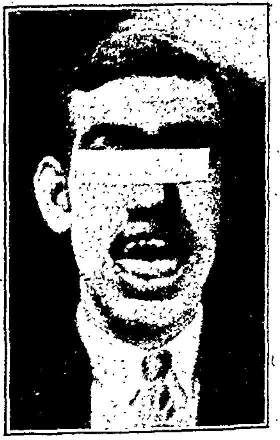
(*e*) Humphry, in his monograph on a condition which was unilateral only and associated with other abnormalities such as hyper-development of the left side of the face, tongue, and palate, thought the condition was a simple but spreading hypertrophy of the gum tissue, which was either congenital or began in very early life, perhaps at the cutting of the first teeth. He mentions that it commonly involves the entire gums of both jaws on both the buccal and the palatal side.

On considering the various views, I agree with Grieg that the condition is a congenital one which does not manifest itself until the eruption of teeth.

Association of Hypertrophy with Mental Deficiency.

In discussing hypertrophy of the gums many authors have, I think, copied each other slavishly, and reiterated the fact that hypertrophy of the gums is associated with mental deficiency. Hopson, for example, in his discussion of the ætiology of this condition, says "there is no defective mental condition in this case, as is so often associated with these cases of hypertrophy." Again, Canton showed a case of hypertrophy in a half-witted and strumous subject; he regards the patient's condition as the cause of the hypertrophy. It is true that in some of the cases reported mental deficiency was present, but the condition is not always associated with weakness of intellect. Sleep says that the real cause seems to lie deeper than mere constitutional debility, infection, or even intermarriage, though it is generally understood that the last-named is capable of awakening latent proclivities to disease and intensifying vicious tendencies, physical and psychical. Grieg, discussing the various views, is sceptical about Erichsen's opinion on mental deficiency and hypertrophy of the gums, and does not think his experience among the mentally deficient was large enough to enable him to draw correct conclusions. Grieg had 25 years' experience among the feeble-minded and he infers that no such hypertrophic condition can be noted as peculiarly associated with mental defect. Humphry quotes ten cases, of whom three—namely, the cases of Gross, Murray, and Waterman—possessed feeble intellect. He remarks that hypertrophy of the gums is often associated with other abnormalities, but he was discussing his remarkable case in which the hypertrophy was left-sided only and associated with hyper-development on the left side of the soft palate, tonsil, alæ nasæ, eyelids, pinna of the ear, eyebrows, papillæ of the left side of the tongue and of the face generally. He also quotes ten cases of general hypertrophy of the gums, among which three were of feeble intellect, one had stunted growth, an ill-shaped head, and a protruberant abdomen, two were epileptic, two had abnormal growths of the hair on the body, and one was deaf. Among the cases reported many such defects have been found associated with hypertrophy of the gums, but many of these do not come under the exact category of the case I describe. In the remarkable series of cases described by Murray in 1873, several children, members of one family who suffered from molluscum contagiosum, also had hypertrophy of the gums. I think the condition of the gums was primarily due to this molluscous fibromatous disease, secondary inflammatory changes causing the hypertrophy of the gums. Again, Erichsen's case was one of the same series of children, and the enlargement was part of a generalised disease, neuro-fibromatosis.

FIG. 1.



Photograph of the patient showing hypertrophied gums and dense growth of eyebrows.

Association with Abnormalities of the Hair.

One other abnormality which I think is associated with this hypertrophy has not been sufficiently emphasised. This is overgrowth and irregularity in the growth and distribution of the hair. As the teeth and hair are dermal appendages hypertrophy of the gums may well be associated with excessive hairiness and fibroid enlargement of the skin.

1. Hopson mentions the celebrated case of one Julia Pastrana, who was a member of a family in whom the gums were much hypertrophied and the hair on the whole of the body was very largely in excess.

2. Humphry noticed that the hair on the head was thick and coarse and the vibrissæ in the nostrils were exceptionally long. The hair on the eyebrows of the left side was coarse and abundant, and spread over the median line.

3. Parreidt's case was an Indian girl, aged 7, who had hypertrophy of the gums and very well-developed growth of hair.

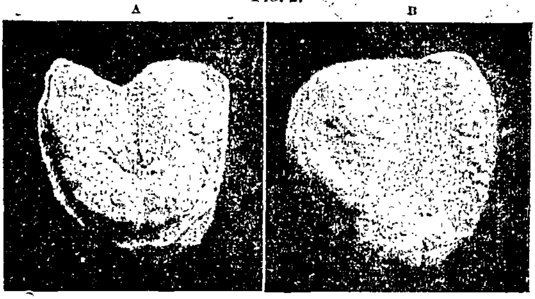
4. Waterman mentioned a woman of feeble intellect, who was exhibited by a Boston showman under the name of the "bear woman." She exhibited huge hypertrophied gums, and her body was covered with a remarkable hairy growth.

5. Pollock's case was noticed to have from birth an unusual quantity of hair on arms, legs, and head.

Description of Author's Case.

The patient, a french polisher, aged 20, came to me early in 1928 complaining chiefly of foul breath and bad taste in his mouth, and suffering from ulcerative stomatitis. He is the sixth member of a family of 11 children, all of whom are in good health, none of them suffering from bad teeth or showing signs of gingivitis. The parents are not consanguinous, are poor working-class people, and do not live under good sanitary conditions. The mother gives a history of three miscarriages, but has not suffered from any diseases except chronic rheumatoid arthritis. The father has fairly good health. The mother says: "The child never had teeth; at the age of 3 he was taken to the Metropolitan Hospital for that reason, and from there he was transferred to Great Ormond-street Hospital." Unfortunately, I have been unable to trace the history of the case at Great Ormond-street, the notes having been destroyed. According to his mother, his gums were there lanced top and bottom, to allow the teeth to come through, and she dates the hypertrophy of the gums from that date. The man asserts that he never had teeth from the age of 4 until the age of 19, and that he managed to chew on his enlarged gums. He never had rickets, or suffered from tonsils or adenoids or from enlarged cervical glands. He has had no other illness of any importance. He is a normally developed male, and is certainly not mentally deficient. He has no other physical defects. His hands and feet do not show any signs of enlargement, and the latter are in perfect proportion to his body.

FIG. 2.

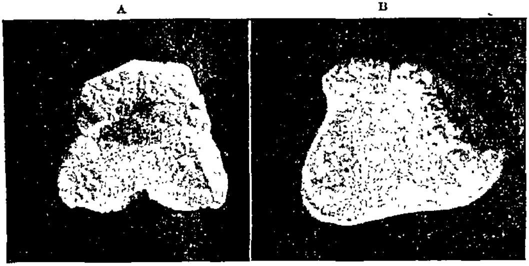


Model of upper jaw (A) before operation, and (B) after operation. (It was impossible to take a complete impression owing to the size of the masses filling the mouth.)

The growth of hair on his body is rather remarkable. It is thick and black, and the distribution on his arms and legs is much denser than that of the average hairy male. The hair on his legs, however, is remarkable in that it is evenly distributed over the whole of the leg and does not stop at the pubic region but is continued on the buttocks and well above the sacral region and tapers up his spine. The hair is long and coarse in texture. On his face the hair is coarse and dense, and the eyebrows are extremely dense and continuous over the bridge of the nose. The texture of the skin of the face is rather coarse, and he has a sallow complexion and suffers from slight acne. His mother asserts that as a child the whole of his body was covered with very fine hair.

He has huge hypertrophied lips, upper and lower, his mouth being so prognathous that his lips cannot be comfortably strained over the hypertrophied gum masses, the mouth being always kept half open. Between the lips the hypertrophied masses of gum tissue look, as Heath described in one of his cases, "like the mouth of a hippopotamus or a rhinoceros on a small scale." (Fig. 1.)

FIG. 3.



Model of lower jaw (A) before operation, and (B) after operation.

Inside of the Mouth before Operation.

The tonsils were slightly enlarged and ragged. The uvula was enlarged and lengthened, and was approximated to the dorsum of the tongue. His tongue gave the impression of being long and thin, owing to its confined position between the hypertrophied masses of gum; but when protruded it was seen to be normal in size and shape.

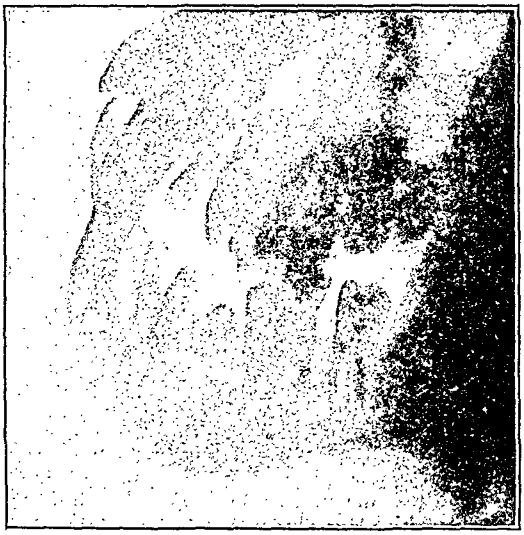
The lips were pushed forward by the hypertrophied masses and the lower mass of gum tissue protruded, everting the upper larger mass. The gum tissue was of normal colour, but rather firm and coarse in texture.

Upper Jaw.—The hypertrophied mass (Fig. 2A) consisted of two ill-defined masses, one extending from the posterior right extremity of the jaw to the region of the left canine or premolar, where there was a dip in the tissue extending from the palata to the buccal side; the other from the second premolar to the left posterior extremity. This latter mass extended across the mid-line of the palate, meeting its fellow of the other side. The proximity of the two masses gave the impression of a cleft palate, the cleft posteriorly admitting only the thickness of a visiting-card, and anteriorly widening out into a diamond-shaped impression 1·5 cm. in its greatest diameter. The mass in the anterior region was 2·4 cm. thick bucco-palatally, the mass in the right posterior region 3 cm. thick, and that in the left posterior region 3·3 cm. The depth of the mass anteriorly from the under-surface of the gum to the reflection of the buccal mucous membrane was 2·5 cm.

The only teeth present were the upper right first and second premolars and molars, and the left canine; only the tips of the cusps were showing, looking like an ivory island in a sea of pink flesh.

Lower Jaw.—This consisted of three ill-defined masses extending (1) from the right third molar to the right second premolar; (2) from the first right premolar to the left first premolar, where there was a dip extending to about the first molar: and (3) embracing the first to the third molars. (Fig. 3A.) The left mass in the anterior region was 1·9 cm. thick bucco-lingually, the left 2·2 cm. The right posterior mass was 1·9 cm. thick bucco-lingually, the left posterior mass 1·9 cm. bucco-lingually. The teeth present were the right second premolar, first right molar, left first molar and second molar. The teeth protruded to a depth of 1·3 mm. The buccal mucous membrane was raised in ridges, which partially covered the hypertrophied masses of gum tissue.

FIG. 4.



Skiagram of jaws.

At St. Bartholomew's Hospital Mr. J. E. H. Roberts resected a portion of the gum on the right half of the upper and lower jaws.

Right Side of Mouth after Operation.

The teeth are displaced either inwards or outwards by the hypertrophied masses of gum tissue. The only one missing is the first incisor, which was extracted at operation. The incisors and canines are all inclined outwards; the premolars and molars face inwards—that is, lingually. Intervening masses of tissue cause undue and irregular spacing of the teeth. The top jaw (Fig. 2B) is similar to the bottom jaw (Fig. 3B) in appearance, and all the teeth are present.

It is important to have a dental report on the teeth, which now appear for the first time, as it may be suggested that the hypertrophy was due to infection, in which case there should be pathological changes in these teeth. One suggestion made to me by a dental surgeon was that minute sinuses might lead down to the teeth and through these channels infection might occur, the reaction causing lymphatic obstruction; hence the elephantine dimensions of the gums. Mr. Evelyn Sprawson, dental surgeon of the London Hospital, examined the teeth, and found that they were apparently normal and healthy. Skiagrams of the jaws (Fig. 4) showed that the whole of the permanent dentition was present except the incisor which was removed at operation, and the lower third molars, which were both congenitally absent.

Comparison of the models made before and after operation shows an increase in the hypertrophy in the unoperated side. This is due, I think, to the fact that the pressure of the operated side was removed. There is also a tendency for the hypertrophy to recur on the operated side. This fact has been noted by Grieg in his case, and also in a case quoted to me by Mr. Sprawson.

The Wassermann and sigma reactions of the blood were negative. A microscopical report on the section shows that the nature of the tissue is difficult to determine, but it apparently consists of chronic infective hypertrophied tissue with much fibrous tissue. I have examined microscopically a section lent to me by Mr. Sprawson, taken from a case of general hypertrophy of the gums. This section gives us the same microscopic picture as my case, and suggests that it is a form of defuse fibroma.

As the milk teeth never appeared, there should be evidence of their presence in the jaw bones. From the mother's history "that the child was brought to hospital because he had no teeth, and after lancing no teeth were found," we have good reason to suppose that our subject was a case of a congenital absence of milk teeth; moreover, there is no history of their having been lost. This in itself is a very rare condition. The radiogram of the present teeth gives no evidence of the milk teeth ever having existed. The fact that this man was abnormally hairy as a child, to my mind, strengthens the suggestion of absence of milk teeth. Many cases have been recorded of deficiency of teeth associated with abundance of hair. Colyer quotes the case of Andrian Jeftichfen, in whom the whole of the face, nose, forehead, cheeks, and ears were covered with long brown hair, which also extended partially down the back. His son, Fedor, at the age of 3, showed the same tendency to hairiness. The father had no teeth up to 17 years of age, and eventually only erupted four teeth in the mandible and one in the maxilla. The son, Fedor, at the age of 3 possessed only four incisors in the maxilla. The Burmese family, consisting of grandfather, mother, and son, are said to have been deficient in the number of their teeth, but there is no reliable record. Again, cases are known where entire absence of teeth was accompanied by marked deficiency of hair.

Deficiency of Teeth and Hair Correlated with the Pituitary Glands.

From the foregoing cases it is evident that there is a co-relation between the hair and the teeth; in one class there is a deficiency in both structures and in the other deficiency of teeth is associated with redundance of hair. From this one can, I think, deduce interrelationship with the pituitary gland, knowing as we do that the secretion of the anterior lobe is connected with the growth of the skeleton, skin, and soft tissues. Cushing, in his book on the pituitary gland, mentions hypertrichosis due to excessive secretion of the pituitary. In acromegaly there is osteal hypertrophy of the maxilla and overgrowth of the soft connective tissues and periosteal ends of the fingers and toes. Sleep also suggested a relationship between the endocrine system and the hypertrophy of the gums. McNeill Love has this year described a case of hypertrophy of the gums in a boy aged 18. His case is, I think, one of the rare types we are discussing. Love states that the hands and feet are undoubtedly large, and X ray showed enlargement of the sella turcica, yet Love suggests acromegaly as the cause of the deformity, stating, however, that there were no other signs of the disease present.

On embryological grounds there is evidence of the relation between the anterior part of the pituitary gland and the buccal cavity. The anterior lobe is developed as a tubular prolongation from the epiblast of the buccal cavity, the embryological stomodeum, but the growth of intervening tissue soon cuts off all connexion with the mouth.

I put this hypothesis forward as a tentative suggestion, but in our present state of knowledge of the endocrine system we must leave it to further research to elucidate clearly the exact function of the co-relationship of this intricate system.

I must express my thanks to Mr. C. H. Fox for his skill in constructing the models, and to Mr. Evelyn Sprawson for help and advice.

(*Bibliography at foot of opposite page.*)

A NOTE ON BLOOD TRANSFUSION.

WITH AN ACCOUNT OF A FATAL REACTION.

BY LESLIE J. WITTS, M.D. MANCH.,
M.R.C.P. LOND.,
ASSISTANT PHYSICIAN, GUY'S HOSPITAL; LATE ASSISTANT TO THE MEDICAL UNIT OF THE LONDON HOSPITAL.

(From the Medical Unit of the London Hospital.)

IN the case now reported death was the direct result of a blood transfusion. The patient was not gravely ill before the operation and the preliminary tests were made with care. I am therefore publishing an account of the case and a few notes from the literature of the subject. Transfusion is a relatively simple and safe operation and the great majority of deaths are due to errors in technique. Nevertheless, the operation is not absolutely devoid of risks even in careful hands.

Clinical History.

A woman, aged 29, had been anæmic since the birth of twins three years before. The confinement was normal and there was no excessive loss of blood. Since then she had suffered from shortness of breath, dizziness, and occasional swelling of the feet at night. Her symptoms were alleviated from time to time and then got bad again. There was no obvious cause for the anæmia. Her nutrition and general condition were good and there were no physical signs of disease apart from the anæmia.

She was treated for five months with iron and ammonium citrate, grs. 10 three times a day, and made no improvement. At the end of that time her blood count was: red cells, 3,800,000; Hb, 44 per cent.; colour-index, 0·58; white cells, 7300; neutrophiles, 60·0 per cent.; eosinophiles, 2·0 per cent.; basophiles, 0·5 per cent.; lymphocytes, 31·5 per cent.; monocytes, 6·0 per cent.; the platelets, the fragility of the red cells, and the van den Bergh reaction were normal. A fractional test-meal showed a complete achlorhydria. The urine was normal. It was decided to give a transfusion.

The patient was found to belong to group II., and a donor of the same group was obtained. Immediately before the transfusion, both the cells of the donor and recipient's serum and also the cells of the recipient and donor's serum were matched in the usual way (Panton and Marrack).[11] No agglutination occurred in either specimen. The donor had given blood four times before and "all his patients had done well." The citrate technique was employed and the transfusion went smoothly. The patient complained of headache but nothing unusual was noticed. A few hours later she was sick, and she vomited at intervals during the next 48 hours. She did not have a rigor but the temperature rose to 102·6°F., falling to normal in 48 hours. There was no jaundice. Pain in the back was not complained of till 48 hours after the transfusion. It then persisted till death but was never severe.

A rectal saline was given on the day after the transfusion. On the cessation of the sickness the patient took water, soda-water and orange juice fairly freely by mouth. No urine was passed till the sixth day, when six ounces of very acid urine were excreted. It contained three-fifth volume of albumin, the urea concentration was 0·69 per cent., the deposit contained a few hyaline casts, red cells, many leucocytes, and many epithelial cells. A casual observer would not have realised that the patient was in extremis. Her colour and appearance were good, her mentality clear, the pulse was 64, the blood pressure 120/80. Nevertheless, the blood-urea on this day was 333 mg. per cent. Potassium citrate was given by mouth in drachm doses six-hourly, but the patient began to be sick again and it was omitted.

On the seventh day intravenous injection of normal saline was begun, a pint being given three times daily. Eight ounces of acid urine were passed. On the eighth day grs. 30 of potassium citrate were also given intravenously. Five and a half ounces of acid urine were passed. On the ninth day the blood pressure was 150/90. The patient was drowsy. Two pints of saline and grs. 30 of potassium citrate were injected during the forenoon. In the early afternoon the patient had tetany, but this disappeared after the intramuscular injection of one grain of calcium chloride in 40 minims of water. In the evening of this day one pint of saline and grs. 5 of potassium citrate were injected. Soon afterwards the patient shivered and Chvostek's sign was positive. She was therefore given another injection of one grain of calcium chloride and no tetany developed. Later in the evening 1½ pints of saline were given intravenously. Eight and a half ounces of acid urine were passed on this day.

On the tenth day the blood-urea was 354 mg. per cent., the plasma bicarbonate 33·6 volumes. A pint and a half of saline was given intravenously. The condition of the patient seemed fair. There was no visible œdema, but as there were signs of bronchitis no more saline was injected. The urine, which had previously been strongly acid, was neutral. Eight ounces were passed. There was one-tenth volume albumin, and the deposit contained granular and hyaline casts, red cells, leucocytes, and epithelial cells.

In the early hours of the eleventh day the patient, who had been sleeping comfortably, suddenly sat up in bed and fell back dead.

Findings at Necropsy.

A post-mortem examination (No. 575, 1928) was made by Prof. H. M. Turnbull, and the following is a summary of the findings:—

Examination showed "bilateral pleural effusion (32 oz. right, 12 oz. left), ascites (18 oz.), great œdema of the lungs, œdema of the brain and other organs, and a general anasarca which was relatively slight in the subcutaneous tissue so that the skin did not pit; greatly enlarged kidneys (16½ oz., body 114 lb. 7 oz.) showing a few petechiæ, a swollen, pale, yellowish-grey cortex with obscured pattern, and a dark red-brown medulla; a few petechiæ in renal pelves; general anæmia; hæmatogenous marrow throughout the neck and upper three-quarters of the shaft of the femur and in a few patches beneath."

Microscopic Examination of Kidneys.—"Most of the discharging tubules are filled with fine granules, large lumps or, occasionally, homogeneous masses of an isotropic substance of the colour of brown sugar. In addition to this substance there are frequently many desquamated epithelial cells and neutrophile leucocytes; less frequently there are areas of hyaline albumin. Where the cytoplasm of desquamated epithelial cells can be identified it is finely granular and of the same colour as the granules and lumps. Similar casts occupy numerous collecting and junctional tubules; but in these tubules, especially in the junctional, the brown substance is frequently replaced by deeply eosinophile granules or small spheres, amongst which one or two red corpuscles are occasionally present. The convoluted tubules contain albumin in the form of a net or multiple spheres; the remaining tubules sometimes contain the same or hyaline albuminous casts, but they are more often empty. Within the convoluted tubules there are occasionally one or two red corpuscles. Beneath the capsule in one section there is a small group of tubules filled with red corpuscles. All the tubules are dilated, particularly the collecting. The capsule of Bowman is usually only slightly dilated, and contains pale albuminous spheres. The glomeruli are large, and show no sign of collapse. The basement membrane of their capillaries is swollen, whilst the capillary lumina are wide and rarely contain any red corpuscles. The anæmia of the glomeruli thus contrasts very conspicuously with an engorgement of intertubular capillaries and a great engorgement of the vasa recta. The epithelium of the first and second convoluted tubules shows a very severe albuminous degeneration. Karyokinetic

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figures in epithelial cells are frequent. The interstitial tissue throughout the medulla is greatly rarefied by œdema; the œdema in the cortex is patchy, but in these patches it is extreme. Round-cell infiltration is great round the vasa recta in the upper two-thirds of the medulla, and is considerable in the interlobar connective tissue, beneath the capsule, and in the adventitia of the vessels in the intermediate zone and in the cortex; it is occasionally present round discharging tubules filled with the characteristic casts. The infiltrating cells are chiefly plasma cells and large lymphocytes; small lymphocytes are less numerous; eosinophile leucocytes come next in frequency and in some foci predominate; histiocytes, neutrophile leucocytes, and large mononuclear leucocytes are relatively scanty. One or two myelocytes, myeloblasts, and normoblasts were found within capillaries on searching, but there is no myeloid reaction in the infiltration. There are interstitial hæmorrhages in the medulla round engorged vasa recta, in the interlobar connective tissue, and beneath the surface of a medullary pyramid. Fat, doubly refractive lipoid, and hyaline-droplet degeneration are absent."

The cause of death was suppression of urine following hæmoglobin infarction of the kidneys.

Discussion.

It is difficult to assess the inherent risk in blood transfusion. Most of the fatalities are due to faulty technique. Many of the patients are gravely ill and it may be doubtful whether death was due to the disease or the treatment. Much depends on the condition for which transfusion is given. In acute hæmorrhage severe reactions are rare. In the blood diseases reactions are more frequent and the blood group is sometimes so atypical that it is difficult to find a suitable donor. Severe reactions are so often encountered in the treatment of acute sepsis and acute leukæmia that transfusion is contra-indicated in these diseases. Bernheim,[3] in 1917, collected reports of 800 transfusions from 20 different surgeons. There were four deaths from hæmolysis. No tests had been made in three of these cases. In the fourth it was known that the donor's cells were agglutinated by the recipient's serum. There were six other deaths, four attributed to cardiac dilatation, and two to anaphylactic shock. Thus eight of the ten deaths were due to errors in technique. In the following Table I have summarised some of the more recent American figures, which show the results obtainable to-day. In over 4500 transfusions there were only five deaths, of which four—and possibly the fifth—were known to be due to errors in grouping.

Year.	Operator.	Preliminary tests.	Technique.	Total transfusions.	Deaths.
1919	Pemberton.[12]	Grouping.	Citrate.	1036	3
1923	Copher.[6]	Grouping plus cross-agg.	Citrate and direct	245	2
1925	Kordenat et al[9]	Cross agg.	,,	764	0
1928	Brines.[4]	Grouping.	Direct.	2500	0
	Total			4545	5

Agg. = agglutination.

Mr. P. L. Oliver has very kindly given me the figures for the Blood Transfusion Service of the British Red Cross Society, of which he is hon. secretary. This service has provided donors for 3430 transfusions. Five deaths have been reported. One of these was our own patient. Another was a man with advanced malignant disease who died of syncope during transfusion. In the third case the donor had been wrongly grouped, and in the fourth the patient had been wrongly grouped. In a fifth case the donor belonged to group IV, as was later confirmed by regrouping, but the patient, whose group is not given, died before the completion of the transfusion. It appears from these figures that the mortality of the operation of blood transfusion is of the order of 1–2 per 1000, and that the majority of the fatalities are due to inadequate compatibility tests. Members of group IV. can no longer be considered universal donors, as not a few deaths have followed the adoption of this simple "rule of four"; although the plasma of the donor is greatly diluted in the recipient, it is sometimes rich enough in agglutinating and hæmolytic principles to produce severe hæmolysis. There are few emergencies so urgent that it is not possible to do direct cross-agglutination tests with both donor's cells and recipient's serum and also donor's serum and recipient's cells. With this precaution severe reactions are exceedingly rare though they cannot be absolutely excluded.

In recent years, however, a number of fatal reactions have been described after transfusions although these preliminary tests had been carried out. These reactions are of two types, the hæmolytic and the anaphylactic. It is difficult to understand why hæmolysis should occur after a satisfactory cross-agglutination test. It is suggested (Doan)[8] that hæmolysin and agglutinin are not always present in proportionate amounts in the serum and a slight degree of hæmolysis may be overlooked in the test. Nevertheless, Percy,[13] in a series of 54 transfusions by the direct method, had three instances of severe hæmolysis and two of the patients died; in all three cases the blood of donor and recipient had been tested for hæmolysis before transfusion with negative results. A more probable explanation is that agglutinins are present in such low concentration that they are missed in the preliminary tests. Three instances of fatal hæmolytic reaction have been described in which preliminary grouping or cross-agglutination had been satisfactory, but on repeating the test after the development of the reaction the bloods were found to be incompatible (Baker and Dodds,[1] Copher,[6] Shera[15]). Schneider[14] has collected from the recent German literature an additional six cases in which fatal hæmolytic reactions occurred although there was no agglutination in the preliminary matching of donor and recipient. He is of the opinion that cross-agglutination is not a very sensitive test and that it is better to perform accurate grouping with high titre sera. There are great variations in the strength of agglutinin and agglutinogen in different bloods of the same group, and a blood may be allocated to the wrong group if the test sera are not fresh and active.

The effects of the transfusion of incompatible blood have been described by Pemberton.[12]

> "The clinical picture of these reactions is typical. They occur early, after the introduction of 50 or 100 cubic centimetres of the blood; the patient first complains of tingling pains shooting over the body, a fulness in the head, an oppressive feeling about the precordium, and later, excruciating pain localised in the lumbar region. Slowly but perceptibly the face becomes suffused a dark red to a cyanotic hue; respirations become somewhat laboured, and the pulse-rate, at first slow, suddenly drops as many as 20 to 30 beats a minute. The patient may lose consciousness for a few minutes. In one half of our cases an urticarial eruption, generalised over the body, or limited to the face, appeared with these symptoms. Later the pulse may become very rapid or thready; the skin becomes cold and clammy, and the patient's condition is indeed grave. In from 15 minutes to an hour a chill occurs, followed by a high fever, a temperature of 103° to 105°, and the patient may become delirious. Jaundice may occur later. The macroscopic appearance of hæmoglobinuria is almost constant."

The hæmolytic reaction may be directly fatal or it may lead to death indirectly from suppression of urine. Baker and Dodds[1] have demonstrated the factors which give rise to anuria by some very lucid experiments. Anuria is produced by the blockage of the renal tubules with precipitated blood pigment. Precipitation only occurs if the urine is acid and concentrated. A series of experiments in vitro proved that hæmoglobin is thrown out of solution when (*a*) the reaction of the medium is not more than about pH 6, and (*b*) the NaCl content is about 1 per cent or over. If the urine is alkaline, there is hæmoglobinuria but no suppression. Thus it seems that suppression of urine could be prevented by establishing an alkaline diuresis, a safeguard which could easily be adopted before transfusions which are not emergencies. In the case now reported there was no clinical evidence of hæmolysis; the actual transfusion was uneventful and there was no backache or jaundice.

The anaphylactic or foreign protein type of reaction is still less predictable than the hæmolytic. A fatal case has been described by Carrington and Lee.[5] The patient had pernicious anæmia. There was no history of asthma, hay-fever, or other type of protein sensitisation in either donor or recipient:

> "After very careful matching with a number of donors, the patient was transfused by the citrate method with 500 c.c. of blood without any immediate reaction. One half hour afterwards, however, he developed a typical anaphylactic protein reaction with high fever, spasm of the unstriated muscles, asthmatic symptoms in the lungs, involuntary voiding of urine, and several bowel movements. This subsided after one hour, but the man developed acute œdema of the lungs and died eight hours after the transfusion. During the reaction the urine was examined and no hæmoglobin found. The blood showed no hæmolysis or agglutination."

Severe foreign protein anaphylactic reactions seem to be very rare. In the majority of the cases the symptoms are limited to dyspnœa, cyanosis, swelling of the face, and urticarial rashes, and they respond to treatment with adrenalin or morphia. Doan[7] suggests that many of these reactions are due to incompatibility of the white cells. On exposure to an incompatible serum or plasma the white cells undergo vacuolation and disintegration. In Doan's series of 16 transfusions, there were 11 in which both red cells and white cells were compatible; no reaction occurred. There were four in which the donors were incompatible only as to the white cells; severe reactions followed, one proving almost fatal. In the remaining case the white cells were compatible but a severe reaction occurred; re-examination showed that the patient was an atypical group II., and ten different donors were tried before one could be secured with whose red blood cells there was not agglutination in vitro. Doan tests the white cells for compatibility by a modification of the "supra-vital" technique, and this requires much practice before reliable results can be obtained. Other factors which have been considered responsible for these foreign protein reactions are the use of new rubber tubing, excessive acidity or alkalinity and bacterial contamination of the diluting fluids, the presence of small thrombi in the blood, agglutination of the red cells, agglutination and degeneration of the platelets, and the presence of toxic substances in the plasma. Reactions are probably more frequent with the citrate technique than with the direct method. Some of the refinements suggested would remove blood transfusion from the sphere of practical medicine. There is no doubt that the frequency of reactions can be greatly reduced by familiarity with the method employed and rapid working.

The treatment of suppression of urine following hæmolysis is a difficult problem. The experiments of Baker and Dodds indicate the value of alkalis in the prevention and the treatment of this complication. Bancroft[2] has reported a case of anuria following blood transfusion in which recovery occurred after decapsulation of the kidneys on the tenth day. Osman[10] states that suppression of urine is usually accompanied by acidosis, and he has had good results by giving alkalis until the urine becomes alkaline. Very large doses of alkali are sometimes necessary. One of his patients received 1440 grains of a mixture of equal parts of sodium bicarbonate and potassium citrate in 24 hours. Where it is impossible to give alkali by mouth, he advises a drachm of the mixture in a pint of water intravenously. Our own experience with potassium citrate was not a happy one. It produced vomiting when given by mouth, and tetany developed after the intravenous injection of grs. 60 in 24 hours. As the plasma bicarbonate on the following day was only 33·6 volumes per cent. it is difficult to believe that the tetany was due to alkalosis. It may have resulted from the combination of the citrate with the calcium of the blood. It was easily controlled by the injection of calcium chloride. In concluding this report I should like to repeat that the experimental evidence of the value of alkalis in the prevention of suppression of urine after transfusion is so clear that, except in emergencies such as acute hæmorrhage, the operation should not be carried out until alkalis have been given in sufficient dosage to render the urine alkaline.

Summary.

(1) A fatal hæmolytic transfusion reaction is described. Preliminary grouping and cross-agglutination tests had shown no incompatibility. (2) The direct mortality of blood transfusion is about 1–2 per 1000. Accidents can be minimised by careful grouping and cross-agglutination, but a certain risk is unavoidable. (3) The commonest cause of death is suppression of urine from hæmolysis and hæmoglobin infarction of the kidneys. Alkalis are recommended for the prevention and treatment of this complication.

I wish to thank Dr. A. E. Clark-Kennedy for permission to publish this case, and Prof. H. M. Turnbull for the pathological details.

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RECENT STUDIES IN THE BIOLOGY OF THE CANCER CELL.

BY PROF. A. H. ROFFO,
DIRECTOR OF THE INSTITUTE OF EXPERIMENTAL MEDICINE, BUENOS AIRES.

THE one incontestable fact that emerges from the vast bulk of cancer literature is that the cell and its products dominate the neoplastic process, and that physical chemistry will have to clear up the mystery of the cancerous cell. Every cell which uses energy at the expense of its nutritive material does so by oxidation or by excision. In the first case the process leads to the formation of carbon dioxide and water, while in the second case it causes the formation of intermediate bodies. In oxidation there is a complete utilisation of the energy contained in the molecule of the carbohydrate, while in the second case energy is not liberated. Warburg[12] showed that cancerous cells have a similar action on glucose to that of lactic ferments. Normal cells produce lactic acid only in asphyxia, while neoplastic cells always produce it even when freely supplied with oxygen. Warburg aptly compares the metabolism of the tumour cell with that of a normal asphyxiated cell. The lactic acid produced hourly by a piece of rat sarcoma in Ringer solution with glucose is equal to ¼ per cent. of the weight of the tumour. Glässner[3] showed that the injection of glucose into animals with tumours produces an elimination of lactic acid in the urine, which does not happen in normal animals. Freund and Revesz have proved that it is possible to modify the speed of production of lactic acid by insulin, while Woglom has accelerated the development of tumours by adding carbohydrates. These experimental results explain a very common clinical observation—the rapid development of tumours in diabetics. On the other hand, Correa and I[4] have observed the presence of insulin in tumours, a result which seems paradoxical.

The fermentative process, therefore, predominates in the carbohydrate metabolism of the cancer cell, and undoubtedly bears a close relationship to the cell respiration. Woglom and Russell[5] showed in 1921 that oxidation is less complete in neoplastic cells than in normal ones; the more rapid the evolution of the cell the more active its respiration. Neuschloss and I,[6] studying the influence of certain ions and venoms on the respiration, found that prussic acid and other similar substances which exercise an inhibitive action on normal cell respiration have no influence on neoplastic tissue. Adrenalin increases the reduction of the normal cells and diminishes that of the neoplastic; thyroidin acts in the opposite way. The ions Rb, SeO_3 and SeO_4 increase the respiration of adult tissues and diminish that of embryonic or neoplastic cells. We also found that the serum of cancerous animals and patients had an increased reducing power[7] proportionate to the evolution and development of the tumour. Catalysis was less in cancerous than in normal tissues, but the content of glutatium, a body which regulates the mechanism of organic oxidation, is greater in the tumour than in the normal organs. Robin[8] believes that cancer is the result of a ferment, which breaks up protein. Neuberg, Blumenthal, and Wolf mention that the endo-ferments of the neoplastic cell act not only on the protein of the tumour, but also on that of the surrounding cells. Abderhalden[9] and his school found that polypeptids of neoplastic cells are attacked differently from those of normal cells. Tumour tissues have greater lipolytic action on esters than normal tissues. Pregnancy, it may be noted, produces a physiological state with biological reactions similar to those provoked by tumours (Abderhalden).

The Ionic Composition of Neoplastic Tissues.

Investigations undertaken in this Institute[10] show a much higher content of lipoids and especially of cholesterin in neoplastic tissue than in normal tissues. This indicates an accumulation, which depends on various factors; a very important one is the accelerated development. Further investigations showed a disturbance of the nutritive metabolism of the cancerous cell. Cholesterin[11–17] is increased in the serum of cancerous animals and patients, and especially in the tissues of sarcomas and carcinomas, rising sometimes as high as 10 g. per cent. of dry material. The tissues of the animals show values which oscillate between 1 and 1½ per cent. Moreover, the metabolism is balanced by a greater activity of the cholesterinogenic organs. Even in precancerous lesions the cholesterin content is two or three times as great as in healthy tissue. The cholesterol and the water content were in many cases ten times as great in neoplastic as in normal tissues.

In consequence of these results we subjected animals to various kinds of lipoid-free diet. The animals fed on carbohydrates and small quantities of protein with absolutely no fats did not develop tumours, and tumours already present became necrotic in the first few days and later disappeared completely. It is obvious that destruction of such an important element as lipoid must profoundly alter the vitality of a cell. The cell membrane is a colloid, and cholesterin is an important regulator of the permeability of the membrane.

Meyer and Schaeffer[18] showed that in a mixture of lipoids and cholesterin the latter renders lipoids penetrable by water, and so diminishes the restriction of inbibition which determines the fatty acids. The more cholesterin there is in a gelalbuminoid mixed with lipoids the more water will it imbibe. This explains the enormous proportion of water—in certain cases 80 or even 90 per cent.—found in the tumours of rats, which are very rich in cholesterin. This percentage is only reached by embryonic tissues, which have such a close relation to neoplastic ones.[19] Is this hypercholesterinia a product of synthesis in accordance with the function of development, or is it a phenomenon of nutrition by absorption of the membrane of the cell? I have shown[17] that there is also a hypercholesterinia in embryonic tissues proportionate to their degree of development. In a culture of normal heart tissue we observed, after 48 hours, a depletion of the cholesterin of the medium by 2·06 and 8 per cent., while in cultures of neoplastic cells this diminution of cholesterin reaches very high values —59 to 83 per cent. These results show the close relationship between the development of the cells and the adsorption of cholesterin.

Certain ions,[20] [21] [22] especially potassium and calcium, act as regulators of the development of the tissues.[23] [24] [25] Wolf has obtained a retardation or acceleration of development of transplanted tumours according to which elements were in excess. Theis and Benedict found an increase of potassium in the blood of patients suffering from cancer with rapidly growing tumours. Our determinations on adult embryonic and neoplastic tissues have shown a relation between the potassium and the activity of development. We have observed a correspondence of the K/Ca relation[26] to the development of the tumour. If the value is 6·54 in tumours at the most active stage of their development it will be 3·56 in tumours in which the rate of development has decreased and which have zones of tenderness. The variations are almost entirely in the potassium; the calcium is present in nearly equal quantities in all cases.

We have observed variations which show that the conductibility of the normal and neoplastic tissues is specific and much greater in the tumour than in the normal spleen, liver, and other organs. We attribute those differences to the action of the electrolytes, especially the potassium, the amount of which varies according to the tissues. We have noticed a similar phenomenon with zinc, which Delezenne regards as an essential cellular constituent. The amount of it present in a tumour varies proportionately with the period of development. The zinc contained in these tissues is not dialysable, and must therefore be present in the form of a protein compound; this conforms with the investigations of Delezenne, who proved that the more proteins snake-venom contains the more zinc there is present.

We have demonstrated the influence of these ions on the development of tissues in vitro.[24] It was necessary to use very high dilutions of calcium to secure development. The results obtained by Zwaardemaker and Campbell and Wood suggest that potassium emits beta rays. The former noticed that the radio-active effect of calcium was to retard growth.

Summary.

The biology of cancer concerns two factors: one inherent in the cell and the other depending on the "terrain." The modifications in the evolution of the tumours in accordance with biological alterations of the "terrain," differences in the chemical compounds, the colloids, and so on, attribute special importance to this factor; but we must ask whether the chemical alterations of the tissues and their hormones prepare the "terrain," or whether the modifications are a consequence of the altered biology of the neoplastic cell. In the solution of this question lies the better understanding of the precancerous state.

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(*Continued at foot of opposite page.*)

Clinical and Laboratory Notes.

A CASE OF CEREBRAL SYMPTOMS FOLLOWING VACCINATION.

RAPID RECOVERY AFTER INTRATHECAL INJECTION OF POST-VACCINAL SERUM.

By Sir Thomas Horder, Bart, K.C.V.O., F.R.C.P. Lond.,

PHYSICIAN IN ORDINARY TO THE PRINCE OF WALES; PHYSICIAN TO ST. BARTHOLOMEW'S HOSPITAL.

In the report of the Committee on Vaccination presented to the Minister of Health in July, 1928, are to be found these words (pp. 200–201):—

> "The occurrence of post-vaccinal nervous disease, however seldom it may occur, is of serious import and cannot fail to have an effect on vaccination both in its administrative and in its purely medical aspects. We have pointed out the extreme rarity of such manifestations, particularly after revaccination, and after primary vaccination in early infancy. Early infancy remains therefore the time of choice for primary vaccination.
>
> "We are of opinion that only publicity among medical circles of the knowledge and experience relating to such cases as might occur in the future, both in this country and abroad, will ensure the accumulation of clinical and epidemiological data and at the same time aid the prosecution of special researches devoted to the solution of this problem."

It is in deference to this injunction that the following case is now put on record.

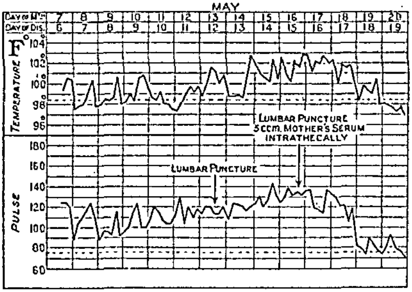
The Case Described.

A. B., a boy aged 4½ years, was brought to the casualty department of St. Bartholomew's Hospital on May 2nd, 1929. The mother stated that four days previously the child vomited, was puffy in the face and legs, suffered from headache and earache, and was found by the doctor to have a temperature of 100° F. The child was put to bed for two days, and then, seeming better, was allowed to get up, but complained of pain in the toes on attempting to walk.

In the room in which the child and his mother were waiting during the examination of the former there was also waiting another child found to be suffering from small-pox. It was therefore decided to vaccinate A. B. and his mother, and both, then and there, received four insertions of lymph. The child was then kept in an observation ward. At this time (May 2nd) there was no pyrexia. There was some general glandular enlargement, some petechiæ about the arms, legs, and back (? due to flea-bites), and the left elbow and left knee were tender on palpation and painful on movement. The tonsils were large and red. There was an apical systolic bruit and the apex-beat was displaced slightly outwards. The urine was free from albumin and blood.

The vaccination took well and the temperature rose on the sixth day (May 7th). On the eighth day the child became drowsy, and on the eleventh day he was stuporous. He vomited on this day. The limbs were entirely flaccid, but there were no pareses and no ocular palsies. (For temperature and pulse-rates see chart.) A lumbar puncture on the twelfth day yielded 10 c.cm. of cerebro-spinal fluid; Fehling reduction within the usual limits, total protein 0·03 per cent., red blood cells 52 per c.mm., white cells 4 per c.mm. (? a little admixed blood). The blood leucocytes were 8400.

The stupor and hypotonus continued on the thirteenth–fifteenth days (knee-jerks natural, flexor plantar response.) On the fifteenth day the lumbar puncture was repeated and, on Dr. Mervyn Gordon's suggestion, 5 c.cm. of the mother's serum was slowly injected intrathecally. The child's cerebro-spinal fluid was again normal on this occasion. On the seventeenth day the stupor lessened, and the child wept naturally. Hypotonus were still present. On the nineteenth day the child was more lively and the improvement in the mental state was thenceforth rapid. On the twenty-sixth day he talked for the first time since the cerebral symptoms began. A serum rash developed on the twenty-seventh day (twelfth day of injection). The subsequent course of the illness was uneventful save for a rise in the pulse-rate, which fell on getting the child up.



The mother's vaccination took well. She had been vaccinated once before, during infancy. She lost her sense of taste and smell for three weeks after the onset of her vaccinal symptoms, but she had no other nerve symptoms.

Discussion.

It is to be noted that in this child vaccination was undertaken during the late stage of some infection of unknown nature. There is therefore some suggestion that the virus of the vaccinia may have activated another virus, and that the cerebral symptoms may have been the result of the combined vira. If so, the case conforms to the third of the three possible explanations, offered by the Committee above referred to, of the occasional occurrence of encephalitis-like symptoms following vaccination.

It cannot, on the other hand, be safely inferred that the cerebral symptoms were due to the virus of the original disease alone, because the striking effect of the mother's serum suggests the operation of specific vaccinal antibody in this serum. Albeit the possibility that the good effects of the serum may have been non-specific must not be lost sight of. Should opportunity occur it may be that a trial of normal horse serum would lead to a similar good result.

This child received four insertions, and all of them took well. There is a suggestion here that, whether the Committee's recommendation in favour of one insertion only during infancy (with revaccination at 5–7 years and at 14–16 years), be followed or not, it should certainly be followed in all children who are suspected of recent infections of whatever kind, and in all persons at the time of their first vaccination.

Prof. A. H. Roffo: References.

(Continued from previous page.)

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A FATAL CASE OF "POST-VACCINAL" ENCEPHALITIS.

By John F. Taylor, M.D. Camb.,
PATHOLOGIST, ST. GEORGE'S HOSPITAL, LONDON.

The following case of a disease which is attracting considerable public attention at the present time seems worthy of record.

Story of the Case.

C. D., a maid-servant, aged 31, had for two or three years suffered from "anæmia, rheumatism, and menstrual trouble," but was able to carry out her duties. On May 22nd last she was vaccinated *for the first time.* "Government" calf lymph was used and it appears that 29 other persons, including C. D.'s mistress, were vaccinated from the same batch of phials without any ill-effect. C. D.'s vaccination "took" well and pursued its normal course, the arm was kept covered, and the dressing changed from time to time. On June 3rd, 12 days after the vaccination, she felt unwell on waking in the morning, vomited once, and stayed in bed, but as she had had similar attacks before no alarm was felt. In the afternoon she was found to be semi-conscious. On the following day, as she was unconscious and could not be roused, she was admitted to St. George's Hospital under Dr. Anthony Feiling.

On admission: Pallid, unconscious, but moved all limbs when pinched or pricked and resisted movement. The eyes were half open; pupils small and equal, reacted sluggishly to light; fundi not well seen. Reflexes: biceps, triceps, and supinators present, abdominal not obtained. Knee- and ankle-jerks brisk, plantar response flexor. Kernig's sign not present. No spasticity, no head retraction. Nothing abnormal detected in heart, lungs, or urine. Temp. 104·5° F. Pulse 120. Resp. 40.

On June 5th coma deeper. Complete flaccid paralysis of lower limbs. Incontinence. The eyes now showed a well-marked divergent squint. Right pupil larger than left and showed no reaction to light, left pupil reaction very sluggish. Knee-, ankle-jerks, and plantar response absent. Many coarse râles all over lungs. At intervals there was a fine chattering of the lower jaw with about 150 movements per minute. A diagnosis of acute encephalo-myelitis was made. Lumbar puncture was performed. The fluid was under pressure and opalescent; it was examined by Dr. E. L. Hunt who reported: "Slightly cloudy fluid containing a small contracted clot. Centrifuged deposit, blood present. An excess of leucocytes, not marked; polymorphs and lymphocytes (latter 40–45 per cent.). No organisms found. Sugar: Well marked reduction. Globulin: no excess. Albumin: opaque cloud. Cultures: sterile." Temp. 103°–104°. Pulse 100–110. Resp. 35–45.

On June 6th coma was still deeper but there was very slight response to pricks on arms and face. Biceps, triceps, and supinator reflexes present but all others absent. Slight cyanosis. Temperature, pulse, and respiration as before. Death occurred at 4.30 A.M. on June 7th, about four days after the first appearance of symptoms. Treatment had consisted of cold sponging, nasal feeding, and stimulants.

Post-mortem Appearances.

An examination made 8½ hours after death showed the body of a well-nourished woman. On the left upper arm were two healthy vaccination scabs with no local swelling or inflammation. The serous sacs contained no excess of fluid. Heart normal. Lungs: some early fibrinous pleurisy at the left base. Nodules of inactive fibro-caseous tuberculosis at both apices. Intense congestion and œdema with early hypostatic consolidation at bases. Liver congested. Spleen congested but rather soft. Kidneys: cortex cloudy, general congestion. Bladder distended with urine. Brain: some general swelling shown by flattening of the cerebral convolutions; a well-marked "pressure cone" on the cerebellum. No meningitis but the surface was everywhere intensely congested and of a cherry red colour. On section some increase of fluid in the ventricles was noted. The internal vessels were also intensely congested but no hæmorrhages were apparent to the naked eye. Spinal cord: intensely congested and somewhat softer than normal throughout its length. The other organs showed nothing abnormal.

A preliminary microscopical examination has been made of sections of the basal ganglia, crus cerebri, lumbar cord, and kidneys. No meningitis is present, all vessels are intensely congested. In all the sections foci of cellular reaction are seen. These are always related to vessels and form a scattered and rather widespread zone around them. No such foci are found apart from vessels. The cells resemble endothelial cells in size and shape and have fairly clear oval nuclei. The perivascular sheaths are as a rule empty but some contain a few cells of lymphocytic type. No polynuclear cells are seen. One very small hæmorrhage was noted in basal ganglia. In the more intense foci many of the ganglion cells show degeneration of varying degrees. Areas of demyelination of nerve-fibres were noted particularly in the section of the cord.

The kidneys showed intense congestion of the glomerular tufts and moderate congestion with a few small hæmorrhages elsewhere. The convoluted tubules showed well-marked degeneration of the epithelium in contrast to the deeper tubules which appeared healthy.

Commentary.

These findings appear to me quite consistent with those recorded in other cases of post-vaccinal encephalitis. The main points of difference from acute anterior poliomyelitis and epidemic encephalitis lethargica are:—

1. The distribution of the lesions throughout both brain and cord.
2. The foci of inflammation tend to be larger and are all related to vessels but the perivascular sheaths are practically free from cells.
3. The predominant cell is of an endothelial not a lymphocytic type.
4. The demyelination of nerve-fibres is marked.

The precise ætiology of these cases is not yet clear and I do not propose to embark upon a discussion of theories, but certain points seem to be established and to be supported by this case: (1) Encephalitis (with possibly very rare exception) follows primary vaccinations only. (2) It does not occur after unsuccessful vaccination. (3) There is no evidence that it is due to a secondary infection. (4) It is independent of the method or animal used in preparing the lymph. (5) Very young children seem to escape this complication.

I wish to express my thanks to Dr. Anthony Feiling for providing me with the clinical details of the case, and to Dr. E. L. Hunt for his report on the cerebro-spinal fluid.

ORAL IMMUNISATION AGAINST TYPHOID IN SOUTH AFRICA.

By Eustace Cluver, M.D., D.P.H.,
ASSISTANT HEALTH OFFICER FOR THE UNION OF SOUTH AFRICA.

Of the seven million persons resident in the Union of South Africa, five and a half million are non-European, the great bulk of whom are uncivilised. This large non-European population is the reservoir from which the towns and industries of the Union draw their unskilled labour. These people in general have little conception of hygiene, and unless carefully supervised will congregate in the towns under grossly insanitary conditions. Typhoid fever, so closely associated with insanitation, is therefore rife amongst them. It is prevalent not only among natives living under urbanised conditions in close association with Europeans in the towns, but also in the kraals, where conditions are also often grossly insanitary. Many of the smaller towns have primitive sanitary services, with badly conducted, single-pail night soil systems, abundance of flies, and exposed and untreated water-supplies.

TABLE I.

Year.	Typhoid notifications.	Year.	Typhoid notifications.
1923 ..	4163	1926 ..	4454
1924 ..	3859	1927 ..	4018
1925 ..	4390	1928 ..	5787

The Union Health Department is actively engaged in improving sanitary conditions by a system of health inspections, general advice, and other propaganda. But in the meantime typhoid continues to take a heavy toll. Notifications of this disease during recent years in the Union are shown in Table I.

The actual incidence of the disease is probably very much higher than indicated by these figures. Only a small proportion of natives living in country districts consult a doctor during typhoid; and unless some circumstance, such as exceptional severity, attracts the attention of the magistrate or district surgeon such cases go unnotified. On the gold mines of the Witwatersrand the annual incidence of typhoid per 1000 natives employed, except on well-conducted, sewered mines, is seldom below unity, and on sanitarily unsatisfactory mines it is generally over 5.

Vaccination.

Although sanitation is making steady progress throughout the Union, the high incidence of typhoid has called for more direct action. Inoculation by the injection method is impracticable on a general prophylactic scale, owing to the fact that a skilled process, which can only be carried out by members of the medical profession, is involved, and to the resistance offered by natives to a somewhat painful proceeding. Natives in general are, however, curiously willing and even eager to absorb medicines ("Muti") by mouth. The method devised by Prof. Besredka of orally administering the vaccine in combination with a gall pill presented a method of general prophylaxis very acceptable to the native.

The vaccine is being prepared on a large scale by the South African Institute for Medical Research. At first it was supplied only as a suspension of killed *B. typhosus*, *B. paratyphosus* A and *B. paratyphosus* B (in much greater concentration than that used in the ordinary T.A.B. vaccine), together with pills of of ox-bile, coated with keratin in order that they might pass through the stomach undissolved and prepare the intestine for the absorption of the injected vaccine. A teaspoonful of the vaccine (well shaken before using) is administered along with one of the bile pills on each of three successive mornings before any food has been eaten. The Institute first started the routine manufacture of this vaccine in April, 1925. The suspension is still being produced and is being used for mass prophylaxis on certain mines. Since May, 1928, the vaccine has also been put up in the form of pills, and it is in this form that it is being issued to medical practitioners and local authorities. Twelve different strains are used in its preparation. Each strain is cultivated separately in broth medium for about 24 hours at 37° C. To the broth culture 0·5 per cent. formalin is added and allowed to act overnight. The medium is then centrifugalised and the sediment is dried in the incubator, after which it is ground in a grinding machine. From the powder the pills are prepared, each pill containing 0·015 g. of dried bacilli which is approximately equivalent to 45,000 million organisms per pill. Vaccine for oral administration is also being prepared, put up in pill form, by at least one private laboratory. Altogether the number of triple doses of this oral vaccine issued by the South African Institute for Medical Research up to the present is, in the form of suspension, 31,141, in the form of pills 17,154.

Experience on the Mines.

The first large-scale experiment with oral vaccine in this country was made on a Mine "A" in the Germiston area.[1] This mine has two compounds about a mile apart, one housing 1850, the other 1750 natives. A typhoid outbreak (probably fly-borne from unknown carriers, the mine using the conservancy system) commenced on the mine in November 1922. Oral vaccination was performed between Jan. 4th and 12th, about 3500 natives being vaccinated and about 100 being missed. The total number of cases admitted to the mine hospital during the outbreak was 53. Of these, 33 were admitted previous to Jan. 4th, and 20 between Jan. 4th and Feb. 24th. After that no further cases were admitted for several months. Of the 20 cases admitted after vaccination had commenced, four had not been vaccinated. The remaining 16 were admitted late in the disease, which suggests that they were in the incubation stage when vaccinated. The great bulk of the natives employed on the Witwatersrand gold mines serve a contract of a year or less. At the end of 12 months very few of the vaccinated natives were left on this mine; and in October, 1923, another typhoid outbreak occurred in the same mine. The natives were again vaccinated and the outbreak brought to an end. Since that date all recruits arriving on this mine have been vaccinated by the oral route, and the annual incidence per 1000 has dropped from 23·3 in 1923 to 10·4, 10·1, 5·2, 4·0, and 4·7 in the succeeding five years. Though typhoid still occurs on the mine its incidence during the past three years has been low for a mine with an unsatisfactory conservancy system and generally very unsatisfactory sanitary conditions. Its present typhoid incidence compares very favourably with that of a mine ("B") in the neighbouring municipality where conditions are in every way comparable, except that routine oral vaccination is not carried out.[2]

TABLE II.—*Typhoid Incidence on Two Mines on the East Rand.**

Year.	Mine.	Cases.		Deaths.		Average number employed.
		Admissions.	Per 1000	No.	Per 1000	
1927 ..	A B	13 127	3·98 11·57	4 30	1·22 2·73	3,291 10,978
1928 ..	A B	16 115	4·74 9·72	4 46	1·19 3·89	3,373 11,826

* With similar conditions except that at mine "A" all native recruits are treated with oral vaccine.

Oral vaccination is being very strongly urged by the Union Health Department on all mines where the sanitary removal system continues to be unsatisfactory. On sewered mines typhoid has virtually disappeared, and its incidence on mines with a satisfactorily conducted dual pail system is very low.

Routine oral vaccination on sanitarily unsatisfactory mines has not caused the disappearance of typhoid, but the incidence has been very greatly reduced.

Experience of Local Authorities.

As mentioned above, sanitary conditions in some of the smaller towns of the Union, particularly among the native populations, are often grossly unsatisfactory. In such towns sanitary improvements are being urged by the Department; but in the meantime, especially in the face of an epidemic of typhoid, mass vaccination is being recommended.

In three municipalities in which the typhoid incidence was high during the year ended June 30th, 1928, mass oral vaccination was introduced early in 1928, and by the second half of the year the typhoid incidence had fallen to relative insignificance. (Table III.)

TABLE III.—*Typhoid Incidence in Three Towns in which Mass Oral Vaccination was Introduced during the First Half of 1928.*

Municipality	Cases during 12 months ended June, 1928.	Cases during 6 months ended December, 1928.
Heilbron ..	97	0
Ermelo	120	3
Bloemfontein ..	48	13

Similar results have been obtained in other municipalities where it was been possible to inoculate the bulk of the population at risk. Very good results have been obtained in Pretoria.[3]

Conclusions.

The experience on the mines and in urban areas of the Union of South Africa, although observations have not been made on strictly experimental lines (no satisfactory control experiments having been practicable), would yet appear to indicate very definitely that the degree of immunity established by the oral method of administration of the vaccine is at least equal to that obtained by subcutaneous inoculations. The immunity appears to be established more quickly. Oral vaccination has two very important advantages; the subjects, particularly natives, are generally much more willing to take "medicine" by mouth than by injection with a needle; no malaise follows oral administration, whereas unpleasant sequelæ often occur with subcutaneous inoculation.

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Medical Societies.

NORTH OF ENGLAND GYNÆCOLOGICAL AND OBSTETRICAL SOCIETY.

A MEETING of this Society was held at Leeds on May 24th.

Vaginal Examinations and Puerperal Infection.

Dr. A. M. CLAYE read a paper on the Puerperal Morbidity-rate in Cases Delivered Normally; a Comparison between Cases Examined Vaginally and Cases not Examined Vaginally. He said that a series of 1546 normal cases at the Leeds Maternity Hospital had been investigated, the following being excluded from the normal category: (1) all cases requiring intra-uterine manipulation or instrumental assistance during labour; (2) all cases where there was any obvious predisposing cause of puerperal sepsis—e.g. ante- and post-partum hæmorrhage; and (3) all cases of puerperal pyrexia due to definite extragenital causes. Cases with perineal tears were classed separately to avoid confusing the issue. Cases admitted to the hospital in labour from outside sources were excluded owing to lack of definite information about vaginal examinations before admission. The morbidity-rate in this class was abnormally high.

The remaining normal cases had been classified according as they were examined vaginally or not, and the puerperium had been described as:—(1) *morbid:* Ministry of Health standard of puerperal pyrexia; (2) *submorbid:* where the temperature reached 99 °F. or more at least twice during the 21 days following delivery; and (3) *normal:* all apyrexial cases, cases where the temperature never reached 99°, and cases where the temperature reached or exceeded 99° on one occasion only. The temperature was taken in the axilla in all cases.

The vaginal examinations had been done in almost all cases by pupil midwives under the supervision of the labour ward sister in order to comply with the existing rule of the Central Midwives Board, which required pupils to perform a certain number of vaginal examinations. The patient's vulva was shaved on admission, the examiner wore boiled gloves, and antiseptic precautions were observed during the examination. The results were as follows:—

CASES WITHOUT PERINEAL TEARS.

Cases Examined Vaginally, 309.

(*a*) Number morbid..	7	or 2·3 per cent.
(*b*) Number submorbid	21	or 6·8 ,,
Total (*a*) + (*b*)	28	or 9·1 ,,

Cases not Examined Vaginally, 778.

(*a*) Number morbid..	10	or 1·3 per cent.
(*b*) Number submorbid	41	or 5·3 ,,
Total (*a*) + (*b*)	51	or 6·6 ,,

The above figures showed that the total morbidity-rate was one and a half times as great for the cases examined vaginally.

CASES WITH PERINEAL TEARS, 459.

(*a*) Number morbid	12	or 2·6 per cent.
(*b*) Number submorbid	50	or 10·9 ,,
Total (*a*) + (*b*)	62	or 13·5 ,,

Probably in cases examined vaginally the increased morbidity-rate was due to the finger moving infected matter from a comparatively safe position in the vagina to a dangerous position within the cervix rather than to the introduction of new organisms. Dr. Claye thought that rectal examination could replace vaginal examination except in the following groups: 1. Cases of antepartum hæmorrhage. 2. Cases where it is important to know the exact size of the os, and this cannot be gauged by the rectum; these are mainly breech presentations. 3. Cases where the doctor has been called in during labour to a patient whom he has not seen before where he cannot decide on the proper treatment without vaginal examination—cases of incompatibility between the head and the pelvis. 4. Cases where the doctor is about to resort to operative treatment. He maintained that the amount of dilatation of the os could nearly always be determined from rectal examination and that this method could also determine the presence of the bag of membranes, prolapse of the cord, and a face presentation. As far as midwives were concerned, their duties under the four indications given above (of which numbers 3 and 4 did not apply) were clear. In antepartum hæmorrhage they had to summon medical aid. In breech presentations, unless uncomplicated, they had to summon medical aid, and no one could be certain that a breech would be uncomplicated until delivery was in progress. He therefore held the opinion that it was not necessary for midwives to make vaginal examinations and that they should be forbidden to do so.

Prof. CARLTON OLDFIELD said that he considered most severe infection was conveyed from outside. He had rarely seen a case of severe infection where no vaginal examination had been made and could not recollect a case of infection where rectal examination only was used. He considered that the main danger lay in doctors and senior nurses who did general work and made vaginal examinations.

Mr. WILLIAM GOUGH said that in Leeds Maternity Hospital they had given up lysol for biniodide and only allowed rectal examinations. In Berne it had been found that this halved the morbidity-rate in the Berne Maternity Hospital, and this institution refused to admit patients who had been examined vaginally outside.

Dr. W. W. KING (Sheffield) said that he had analysed 457 of his own cases. Fifty-five had been examined vaginally and of these one was morbid (1·9 per cent.), but this patient had had a manual removal of the placenta. Four hundred and two had been examined rectally only; of these two were morbid (0·5 per cent.). He considered this group of vaginal examinations too small to be of much value, but using Dr. Claye's classification the one morbid case in this group would be excluded on account of the interference necessary and therefore there would be a higher morbidity-rate with rectal examinations. He pointed out therefore that figures alone could be made to show anything.

Mr. WILLIAM GOUGH showed a specimen of

Hyponephroma of the Ovary.

The patient was a married woman aged 25. She had been normal as a child. When seen she had a deep bass voice and had to shave daily. The menses had appeared at the age of 13 and were regular up to the age of 20 when they ceased, and the changes in secondary sex characteristics began to appear. Her sexual feelings were normal. A mass, separate from the uterus, was found in the left iliac fossa and there was some free fluid. On August 25th, 1928, abdominal section was performed. Two or three pints of straw-coloured fluid escaped and a tumour of the left ovary, which had no adhesions, was removed. It was of a bluish colour with pinkish orange excrescences on its surface. The right ovary and uterus were normal and there were no swellings in the kidney regions. The tumour was reported as a typical hypernephroma.

Twenty-eight days after operation (said Mr. Gough) the menses appeared. They next occurred a fortnight later and thereafter were regular. As the patient had last menstruated on April 6th, 1929, she might now be pregnant.

Dr. **Clara Stewart** said the tumour was a simple benign hypernephroma exactly similar in structure to an adenoma of the adrenal gland.—Dr. **Leith Murray** (Liverpool) asked if male characteristics occurred with unilateral renal hypernephromas, and said that he thought Glynn asserted that they only occurred with bilateral tumours. He (Dr. Murray) had seen a case of sudden change in sexual characteristics in a woman aged 25 in whom no abnormalities in pelvis or renal areas could be found. He asked if the cells in this case could be paralutein cells.—Dr. **Stewart** said she did not consider that the cells showed the characteristics of paralutein cells. It was not necessary for the tumours to be bilateral to cause changes in sexual characteristics.

Miss ***Ruth Nicholson*** *recorded two cases of*

Pyometra.

The first patient was a single woman, aged 49, whose chief complaint was a constant vulval irritation for four to five years and more recently a vaginal discharge. She had had cystitis as a child. The periods commenced at 14 and had always been irregular and scanty. She had not menstruated at all for the last five years. On bimanual examination thickening and fixation of the appendages was felt and a diagnosis of tuberculous salpingitis was made. At operation very marked adhesions were found. The tubes were nodular, closed, and adherent to the ovaries. Panhysterectomy was performed. When the uterus was opened the cavity was found to be filled with a thick yellow pus. Microscopical sections showed typical giant-celled systems.

The second patient was a woman, aged 70, who had had a high amputation of the cervix eight years previously. She complained of a yellow discharge, partial rectal obstruction, and some vaginal hæmorrhage. A mobile, solid mass about the size of an orange was felt continuous with the cervix. At operation the uterus broke away, at the point where the previous amputation had been done, as soon as the vessels and cellular tissue had been cut across. The specimen showed the uterine cavity distended with pus and lined with granulation tissue. Microscopically there was no evidence of malignant disease.

Dr. D. W. E. **Burridge** recorded a case of

Puerperal Infection with Bacillus welchii.

The patient was a primipara, aged 39, admitted to hospital with a diagnosis of prolonged labour and vomiting. Labour began on March 21st, 1929, and on admission on the 25th her general condition was good (temp. 98·4° F., pulse 88). Vomiting had ceased, no pains were present, and the uterus was not tender. No fœtal heart sounds could be heard. The cervix was 5 shillings dilated but not fully taken up.

There was no change on the 26th, but by the morning *of the 27th she was seriously ill, restless, of toxic appearance,* and with a rising pulse. By noon the pulse was 120, the abdomen was distended, and the uterus tender. Preparations were made to assist the uterus to empty itself. The cervix was now half dilated and an unsuccessful attempt was made to dilate it manually. This manipulation allowed the escape of a quantity of highly offensive gas, and some foul, frothy brown fluid. As immediate evacuation of the uterus was inadvisable axis-traction forceps were applied and a weight of 7 lb. was attached to the traction rods over a pulley. Pituitrin, 4 minims, was given at ¼-hourly intervals for five doses. These measures were successful and by 5 P.M. the child's head was born. There was considerable difficulty with the delivery of the trunk owing to the enormous gaseous distension of the abdomen. After delivery there was a free escape of browny frothy fluid and much gas but no hæmorrhage. Swabs from the interior of the uterus, umbilical cord, and fœtal abdomen gave a good growth of *B. welchii*. The patient stood delivery well but in the evening restoratives were necessary. On the next morning *she was a little better but the placenta was still in the uterus.* It was left alone as it was not causing symptoms.

On March 28th 10 c.cm. of Weinberg's anti-gas-gangrene serum and 40 c.cm. antistreptococcal serum were given. Further doses of anti-gas-gangrene sera were given on the 2nd, 3rd, 4th, 5th, 6th, 8th, and 11th days of the puerperium. Attempts to express the placenta on the 4th and 5th days of the puerperium were useless but very painful. The patient remained in extremis for four days after delivery and a change was then noticed; once this was manifest the progress towards recovery was remarkable, despite a vesico-vaginal fistula which became manifest on the 6th day. By the 17th day the uterus was down to the pubis and the lochia were scanty and non-offensive. The patient was sitting up on the 21st day and walked a few steps on the 35th day.

The main points of the case (said Dr. Burridge) were: (1) the absence of hæmorrhage; (2) the fact that the placenta was never recovered would suggest that it was liquefied; (3) the retained placenta might have prevented the spread of infection; (4) the value of anti-gas-gangrene serum.

Dr. E. O. **Croft** remarked on another case in which a weight and traction rods were used to secure delivery.

Prof. **Oldfield** mentioned a case of full term ectopic pregnancy in which the child was extracted but the placenta never came away. Later this patient had an operation for ventral hernia and no trace of the placenta could be found.

Dr. J. E. **Stacey** (Sheffield) commented on the method of delivery as being useful in cases where there were no pains, and a dead child, in the presence of infection of the mother.

Dr. **King** had had three cases of *B. welchii* infection, in none of which the patient had recovered. He thought the conduct of labour in this case had been admirably conservative. The idea of forceps plus a weight was valuable, but it had its dangers, as witness the vesico-vaginal fistula in this case. In his opinion labour ceased because there was an œdema of the uterine muscle which caused paralysis. He had had a case in which he left the placenta in situ and on the 10th day a piece about the size of five shillings was passed and that was all. He considered that in the presence of a gas-forming organism tissue destruction must be much more rapid.

Dr. **Murray** had seen two cases of gas-gangrene infection both of which were fatal. The distressing feature he noticed was that the patients were acutely conscious to the end.

Dr. **Bailey** had seen a number of cases of retained placenta. He always left the placenta alone in the absence of symptoms. Altogether he had had about 30 cases and quoted some in which the placenta came away at varying intervals from 30 hours to 6 days, and one case where the woman would not allow him to examine her or see the lochia. In this case, to the best of his knowledge, the placenta never came away. She was seen in his surgery two months after her confinement, quite well.

Prof. **Carlton Oldfield** reported two cases of

Entero-vesical Fistula.

The first patient was originally seen in 1914, when a diagnosis of diverticulitis was made and a pelvic abscess drained by posterior colpotomy. In 1928 the patient had three attacks of pain at different times, and after the third attack began to pass fæces and flatus from the bladder. This made the speaker still more certain that the condition was diverticulitis. The patient now had so much trouble that something had to be done. No information was obtained from cystoscopy. Abdominal section was performed and very dense adhesions found. Eventually the bladder, uterus, and sigmoid were separated, and a stony hard swelling was found adherent to the uterus and sigmoid. This was eventually separated, leaving a hole in the sigmoid and a track lined by granulation tissue was found leading down to the bladder. The track was scraped and the hole in the sigmoid closed. The patient later developed obstruction which was relieved by a cæcostomy and thereafter she made a good recovery. The report on the nodule was "typical, caseating, active tuberculosis; some parts of ovary, and plain muscle are present." Prof. Oldfield thought that the original lesion must have been tuberculous salpingitis. The second case was one in which a vesico-vaginal fistula followed a Wertheim's operation. The fistula was repaired and a few days later urine was being passed per rectum. No further treatment was undertaken for this patient and she remained quite well. Her only disability was the necessity for frequent bowel actions to pass urine.

in the text illustrate the habitat and associations of the plants described. The English botanist will find included a large proportion of his native flowering plants and grasses as well as the alpine and sub-alpine species with which he meets on his holiday tours. Obviously no public library would be complete without a copy of this work, and to any lover of flowers it will afford a never-ending source of enjoyment. The total cost up to date of the twelve volumes in paper covers is 369 marks, or bound in linen boards 406 marks, and it is understood that the price will be raised as soon as publication is complete.

PEDIATRICS FOR THE GENERAL PRACTITIONER.

By H. M. McCLANAHAN, M.D., Professor of Pediatrics, University of Nebraska. London: J. B. Lippincott Company. 1929. Pp. 606. 25s.

THIS book differs in some respects from the majority of pediatric text-books of similar size; it is written for general practitioners rather than students, and deals fully with practical points of diagnosis and treatment while little space is devoted to pathology. It is profusely illustrated by photographs and radiograms. A praiseworthy amount of attention is paid to the characteristics of the normal child, and to the details of breast feeding. The author believes that the degree of attention which has been focused upon complicated methods of artificial feeding has led to some neglect of breast feeding. He includes a short description of percentage feeding. The common disorders of childhood are treated clearly and practically, though the distribution of space is somewhat uneven. Rickets, for instance, is treated too briefly, and no mention is made of irradiated drugs. On the whole the book is satisfactory.

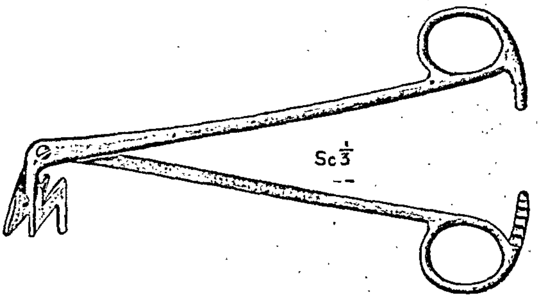
JOURNALS.

JOURNAL OF INDUSTRIAL HYGIENE.—Various aspects of the cost of illness to industry are considered in the issue for April. The first paper is by E. W. Phillips dealing with tuberculosis in an industrial group. Free medical service without special attention to prevention and detection of tuberculosis did not control the disease. The group of workers concerned were railroad employees, among whom the annual tuberculosis rate was about 1 case in 800. It costs on an average 4600 dollars to put an advanced patient in condition to resume work; a moderately advanced case costs about 1050 dollars, and an early case about 450 dollars. At the same time the mortality in the advanced cases, within four years of detection, was nearly 40 per cent.; while all the moderately advanced and early cases recovered and were able to return to work. The occurrence of nervous illness in industry is discussed by Millais Culpin, who points out that such industrial neuroses as cramp among telegraphists, which he has specially studied, and miners' nystagmus are really only particular manifestations of the existence of a large mass of nervous individuals. A paper by him on Nervous Disease and its Significance in Industry has appeared in THE LANCET (1928, ii., 897).—The third aspect is the relation between lead absorption and compensation, which is presented by M. R. Mayers. It is based on a physical examination of 381 lead workers. Of these, 149 were suspected of lead absorption, but when laboratory methods were applied in 39 cases no basis for the clinical diagnosis was found. On the other hand, among the 232 cases free from any clinical suggestion of lead absorption, laboratory research showed that in 112, or almost half, active lead absorption was taking place. The conclusion drawn is that when laboratory research supports clinical symptoms the case is undoubtedly one for compensation. When there are no clinical symptoms, even though laboratory research indicates lead absorption, there is no disability, and so no case for compensation. The doubtful cases are those where laboratory research shows no absorption, but where there is disability on clinical grounds ascribable to lead. Most of these cases probably are not associated with lead poisoning, hence compensation should not be awarded.

New Inventions.

PERITONEAL TETRA-TOWEL FORCEPS.

THE use of tetra cloths is now regarded as almost an essential in the technique of abdominal operations. The difficulty is suitable forceps. The forceps shown in the figure overcomes many difficulties. It lies flat under the tetra cloth as it has an abdominal curve. Its bite is also horizontal and dips vertically into the wound over the skin edge. The fixation of the towel to the peritoneum is broad and does not damage or tear the peritoneum, and the instrument is sufficiently large to prevent possible loss in the abdomen. Two forceps on each side are required for the average wound—the proximal two are attached by the operator with the assistant holding the peritoneal edge and towel edge in apposition, and the distal two are controlled by the assistant. These instruments are of particular help in Cæsarean sections.

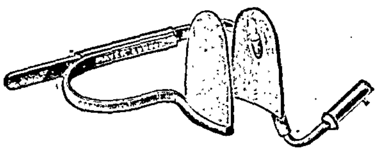


The forceps are made by Messrs. Allen and Hanburys, Limited, Wigmore-street, London, W.

W. McK. H. McCULLAGH, M.B., B.Ch. Belf., F.R.C.S. Eng.

ELECTRICALLY ILLUMINATED NASAL SPECULUM.

THE accompanying illustration shows a simple electrically illuminated nasal speculum. The light-carrier is of the Jackson type, set at an angle through the blade of the speculum, and can be removed for cleansing. The instrument is useful for bedside examination, when it is difficult to obtain a satisfactory light. The same principle could be applied to the Thudichum type of speculum.



The instrument is made by Messrs. Mayer and Phelps, Chiron House, New Cavendish-street, London, W.

JOHN E. G. McGIBBON, M.B., B.S. Lond., D.L.O. Eng.

Radon in Cancer of the Œsophagus.—Mr. Musgrave Woodman calls attention to an inaccuracy in our report of his remarks at the Royal Society of Medicine (THE LANCET, June 15th, p. 1250). When speaking of the external approach to the œsophagus by the operation of thoracotomy, he mentioned that few patients would be suitable for this treatment, but in contrast to this, almost all patients were suitable for the simple operation of introduction of radon through the œsophagoscope.

THE LANCET.

LONDON: SATURDAY, JUNE 22, 1929.

IE MEDICAL PROFESSION IN THE NEW PARLIAMENT.

HEN the last Parliament assembled early in 1925
ere able to publish the portraits of 12 members of
nedical profession who had become members of
House of Commons. We are happy to do the same
he new Parliament which meets on Tuesday next
the profession will have 18 representatives,
ding those in the House of Lords. They
ag to each of the political parties; they also, for
first time, include members of either sex. The
go of Government has caused Major WALTER
IOT to lay down his responsibilities for Scottish
rs in an office which he has discharged with
ked ability and enthusiasm and to the satisfaction
of his political opponents. But medicine has now
ger share of ministerial appointments than before;
ongratulate Dr. DRUMMOND SHIELS on his advent
he India Office where his experience of the not
imilar problems of Ceylon may be useful; and we
come the return to office of Dr. ADDISON, the
Parliamentary Secretary to the Ministry of
iculture.

he incoming Cabinet's programme of legislation
not be officially revealed until the KING's *Speech*
ead at the opening of Parliament. In the present
nce of parties we can expect no major measures
pt by way of compromise and consent. Parlia-
tary time in July must be devoted to completing
year's financial arrangements, of which last
ion's Finance Act was only a brief instalment. Un-
loyment, foreign affairs, and the mining industry
likely to demand full discussion. The Ministry of
lth will be busy with administrative changes due to
recent Local Government Act. Here our medical
bers will watch with special concern the effect
institutional facilities and upon our existing
m of voluntary hospitals. Shall we hear news at
f a new *Factories Bill? This project, so often*
ioned in previous King's Speeches, was the one
ted failure in the late Government's claim of
es fulfilled. Undoubtedly the past five years
seen several useful measures, of particular interest
medical profession, placed upon the statute-book
on the initiative or with the aid of medical
ers. The list includes the Public Health Act
5, the Therapeutic Substances Act, an important
l Deficiency (Amendment) Act, attempts to
te the smoke nuisance and lead paint poisoning
h these efforts fell short of what many desired),
roners (Amendment) Act of 1926, and the
ement of the law of death registration linked
ith, provision for the registration of nursing
amendment and consolidation of the Food
ugs Acts, and a re-statement of the poor-law
already demands a further revision. This
in itself an indication of increasing popular
in public health, was attained in a Parliament
ted by a docile and substantial majority such
not be seen again for several years. These conditions of party government have made us forget the difficulty of legislating in the absence of such support. Private members' Bills may have better *chances of success if both Houses of Parliament* decide to pursue recent suggestions for carrying over a Bill from one session to another. A great opportunity occurs in the field of local legislation for progressive health measures, some of which—as in a recent Edinburgh Corporation Bill—raise acute problems of medical treatment. One topic on which Parliamentary action is long overdue is the control of patent remedies. A Select Committee examined the evidence thoroughly and reported in 1914, but nothing has been done since. Other topics which demand attention are rivers *pollution and atmospheric pollution. Most important* of all, perhaps, is lunacy reform. Parliament has ignored the views of expert advisers and too little is done to combat the early stages of mental disease or to provide treatment for the cases which fall short of certification. Nor must the fact be ignored that certification itself, the key to the present processes of institutional treatment, will break down if the certifying practitioner, upon whose evidence a judicial order is made, is to be exposed to litigation and to such huge awards of damages as have been recorded in recent years.

The medical M.P. is elected, we all know, to represent a constituency, not to press the sectional claims of a particular profession; but he does not divest himself of *his special knowledge* when he goes to Westminster, nor will his contributions to debate on technical or professional subjects, if delivered with reason and moderation, fail to command respect. Some of these subjects will be controversial. Health insurance, vaccination, vivisection, the position of the unregistered practitioner—here are instances of past controversies from which the medical M.P., whatever side he takes, *could hardly stand aloof. Such instances will recur in* plenty; if it be only to conciliate the army of new feminine voters, Parliament must give increasing attention to the health of the family and to public hygiene.

◆

TRIAL LABOUR FOR THE SECOND CHILD.

A TRIAL labour is a labour experimentally allowed to proceed, though the obstetrician has reason to doubt whether a living child of normal size can be delivered at full term. The practice has arisen in recent years as an expression of the reaction which has followed the advocacy of induction before term or of Cæsarean section in all cases where grave disproportion between mother and child is suspected. The expectant attitude now adopted by many obstetricians must not, of course, be confused with the hearty optimism which moved practitioners of an older generation, when a patient came to book her confinement, to note in a diary the probable date, and to dismiss her with the cheerful assurance that all would be well. The essential feature of a trial labour is that it involves more anxious watching than any other method. It should never be conducted in the patient's home, but in an institution equipped and staffed for all emergencies. Its purpose is to save the individual patient from unnecessary interference, not only in her first but in subsequent labours.

Why are the devices for coping with disproportion, *which were held up as triumphs of obstetric art* not so long ago, being superseded in many clinics now by expectant tactics? Is it because serious drawbacks to these methods have lately become apparent or because experience has shown our criteria of measurement or our means of estimating the forces in labour to be unreliable? The new teaching postulates that in doubtful cases—and a good many fall into this category—the patient should be admitted into an institution where her labour can take place under supervision but with no interference in the early stages. If no progress is being made after a period to be determined by the observer and, in respect to which no directions appear to be laid down to guide the less experienced, Cæsarean section is to be performed, since high forceps are now universally condemned. It is claimed that in practice the operation is often found to be unnecessary, because the moulding of the head is so great that a live child is often delivered naturally when this outcome seemed most unlikely. We need seek no further reason for an alteration in obstetric tactics. We have all of us heard of infants emerging per vias naturales, even while preparations were being made for a Cæsarean section, and of the birth of a healthy, large child to a mother whose earlier pregnancies were artificially terminated at the eighth month; but we have assumed that the previous examinations had been conducted by an inexperienced or timid obstetrician, or that the cases were exceptional. Evidently, however, obstetricians have good reason to believe that in a considerable proportion of cases in current practice a prognosis founded on measurements and estimates is too gloomy, though they are unable to state precisely and quantitatively what extra allowance should be made in any given circumstances. It is possible that observation of large numbers of women whose trial labours have been uneventful will give a standard of probabilities which will save their sisters from uncertainty.

Has the point of view of the individual patient been sufficiently considered by the protagonists of trial labour? It would be interesting to learn the views of the educated prospective mother whose pelvic measurements are not normal on the proposal to subject her to a trial labour of uncertain duration or discomfort, which may possibly end in an abdominal operation. If the issues were plainly put before her, she would probably far prefer an induction after the eighth month for her first child, though she might be willing to try experiments for her second should the induced labour show considerable margin. The obstetrician may claim that the conduct of a labour is his responsibility, which cannot be shared with the patient. But her coöperation must be enlisted, not only because her consent to a confinement in an institution must be obtained, but because on her fortitude and patience the issue will largely depend. The desirability of submitting to a test which, even if it fails, will give information guiding the conduct of future pregnancies, is not likely to be considered at a time when the mind is concentrated on hopes and plans for this first child. The emotions aroused can hardly be expressed in terms of stress and strain, but the woman is conscious that if her first child is lost or spoilt the shock and distress may have a profound effect on her subsequent life. This anxiety for the first child is not the prerogative of educated women, whose sisters in other classes differ from her not in emotion but in articulateness. It is a point worth considering whether induction should not be continued as a routine for primiparæ with contracted pelves, reserving the trial labour for the second pregnancy should there have been an encouraging margin when the first child was delivered. Even more useful information would thus be obtained, and the patients would be more likely to face the ordeal without dismay.

VACCINATION DANGERS.

Headlines in daily papers during the past week have contained such phrases as The Death Roll of Vaccination; A Number of Poison Deaths after Vaccination; and Sleepy Sickness Opens New Controversy, which have instilled fear into such newspaper readers as are still susceptible to suggestion of this kind. A Society leader has publicly announced her satisfaction that none of her seven babies has been vaccinated, and the responsible chairman of an Irish Board of Health, when called on to deal with vaccination defaulters, is reported to have said, "I would not advise that proceedings be instituted against them at present in view of the reports that are current about sleepy sickness as a result of vaccination." While parents are still obliged to have their children vaccinated against small-pox, the gap left by conscientious objection has become so wide that in the town of High Wycombe, for instance, exemption was claimed for 93 per cent. of babies born in the last year on record. Is it possible, one may well ask, for the still small voice of preventive medicine to make itself heard above the noise and turmoil of the jarring elements? Prevention is always at a disadvantage, for it is continuously destroying the object-lessons which render its teaching effective. The Anti-vaccination League says that small-pox in England has for many years been a less fatal disease than chicken-pox, and invites us to conclude from this that vaccination is futile. But we may equally well regard the facts as evidence of its success. Vaccination would certainly be futile if small-pox were not a potentially killing disease, but the Registrar-General's figures for the last quarter, which have been regularly quoted in our columns, are a reminder of what punishment severe small-pox when it is reintroduced inflicts on the unvaccinated.

What are the incidents which have given rise to these scare lines? One is recorded by Dr. John Taylor, pathologist to St. George's Hospital, on another page of our present issue, where a healthy woman, 31 years of age, vaccinated on May 22nd, died on June 7th with post-mortem findings consistent, as Dr. Taylor writes, with those recorded in other cases of post-vaccinal encephalitis. Inquests have also been held in London on girls aged 10 and 14 years, in each of which death was regarded as due to encephalitis following primary vaccination. It was quite plain, as the Coroner for Westminster (Mr. Ingleby Oddie) pointed out in one of these cases, that there was nothing unsatisfactory in the lymph or in the method of vaccination or in the treatment of the arm. Whatever view may be taken by pathologists about the exact nature of the infecting agent, unhappily there is no reasonable doubt that these deaths must be regarded not only as post-vaccinal but to some extent as propter vaccinal. The main facts of this risk, as we now know it, were set out with care in a report by the Commission on Small-pox and Vaccination presented to the Health Organisation of the League of Nations at Geneva last August. The problem has arisen in consequence of the events of the last few years in the Netherlands and Great Britain. In the Netherlands 139 cases of disease of the central nervous system following vaccination were described during the period 1923–27, of which 41 were fatal; and in England and Wales during the two periods covered by the reports of the Andrewes (1922–23) and Rolleston (1926–27) Committees, 87 similar cases occurred, of which 48 were fatal. The period between vaccination and the onset of symptoms was usually between 9 and 13 days. In both countries a predilection of the disease for children of school age was noted, only 8 of the English series of 87 being under two years of age. Most of the cases in both countries occurred in children whose vaccination, judging from all ordinary signs and cutaneous reactions, had run a normal course. The Geneva report suggested further inquiry into the existence of post-vaccinal encephalitis in countries other than the Netherlands and England as an essential preliminary to the proper understanding of the causes which have operated to produce this disease in these two countries. Our own Ministry of Health has asked to be kept informed of all cases of central nervous disease in which vaccination had been performed within four weeks of the onset. If, however, the fact of recent vaccination were made obligatory on the certifier, a retrospective investigation of fatal cases would still be possible. The Commission spoke of the minute risk of encephalitis in proportion to the vast numbers of normal vaccinations, a point emphasised in the Rolleston Report by the statement that 51 deaths were reported in a period during which approximately two million vaccinations and revaccinations were performed at the cost of the rates and more than three million charges of Government lymph were issued. Crucial indeed is the fact that disease of the central nervous system is a complication of the utmost rarity among infants vaccinated under the age of two years and of equal rarity after revaccination of older children or adults. In the Netherlands primary vaccination at school age was the rule, but the experience of 1923–27 was sufficient to shake official satisfaction with this method and to occasion a temporary suspension of the administrative measures on which vaccination at school age rested.

Infancy is a dangerous adventure but vaccination happily is not one of its major risks, and the inconvenience it produces might be mitigated. The Rolleston report made a suggestion, warmly endorsed by Mr. ODDIE at one of the recent inquests, in favour of limiting the number of vaccine insertions at each operation. It does not appear to have been determined on any adequate scale what is the smallest amount of virus sufficient to produce immunity, but the report regarded the probable loss of duration of individual immunity, being the result of substituting a single for multiple insertions, as fully compensated by the readier acceptance of vaccination. Dr. G. H. HART and other medical officers of health have long protested that it is a mistake to insist on four insertions, believing that the practical difficulty in obtaining consent to vaccination would largely disappear if the milder method were permitted. But public vaccinators, it seems, have not yet been given discretion in the matter as a sequel to this recommendation. The argument for infant vaccination has been immensely strengthened by the immunity it gives not only against small-pox but against the worst danger (rare though it is) of primary vaccination later. It may be that in the years immediately following on infancy encephalitis, if it should occur may take on a milder aspect. The interesting case recorded in our columns this week by Sir THOMAS HORDER gives some hope in this direction. A boy, 4½ years old, who became drowsy on the eighth day after a primary vaccination and was stuporous on the eleventh, recovered rapidly after intrathecal injection of 5 c.cm. of the serum of his mother who was vaccinated on the same day as the child. This child, who was suffering from a febrile disorder of four days' duration at the time of vaccination, received four insertions of vaccine, and Sir THOMAS remarks that whether the Committee's recommendation of one insertion only during infancy (with revaccination at 5–7 years and at 14–16 years) be followed or not, it should certainly be followed in all children who are suspected of recent infections of whatever kind. The position of small-pox vaccination is unique. As the sole established instance of the use of a living virus as an immunising agent it presents difficulties. We have much sympathy with Mr. ODDIE's view that the recommendations of the Rolleston Report should receive the attention they merit.

Annotations.

"Ne quid nimis."

RIVERS POLLUTION.

LAST month's conference on the pollution of streams and rivers by town sewage and trade refuse did something to press upon public attention a subject too easily forgotten. Just as it is lamentable that, while one Government department is interested in smoke abatement and a purer atmosphere, another department sanctions the establishment of a fresh source of pollution in the Battersea power-station, so it is lamentable that some of our administrators should have imported a great continental industry like sugar-beet cultivation without forethought of the effect of the trade wastes from sugar-beet factories upon streams of which others of our administrators are concerned to secure the purity. A fresh threat to rivers where salmon still abound is to be noticed especially in the County of Devon. The multiplication of garages, usually swilled out every morning, sends oil in ever greater quantities into public sewers or storm-water drains; if it does not actually destroy the fish in the rivers, or drive them back to the sea, it spoils the gravel banks and sedges where the immature fish find their food. On the bigger issues other questions arise. Are we devoting enough time and money to research? Are we solving the problems of particular trade effluents, trade by trade? Cannot more be done to fix standards and enforce them? Can we not make up our minds what is the duty of the local authority in respect of providing means of disposal, and whether the trader is or is not to have a right to discharge his waste into public sewers? To turn a topic over to examination by a Royal Commission is notoriously a process of postponing action. Almost a generation ago the Royal Commission on Sewage Disposal made its recommendations, yet little or nothing has been done. Some say the law is sufficient if it were only administered effectively; others say the law is useless in itself. Several instances of expensive and protracted litigation have probably discouraged local authorities from further effort. When the Joint Advisory Committee on Rivers Pollution had reported, the Ministry of Health urged the formation of Joint Watershed Committees. Is it because of jealousies among the local authorities or because of other preoccupations at the centre that results are so slender? Should the central authority be armed with fuller powers to give final decisions without reference to the law-courts, and should that central authority be the Ministry of Health or some other body old or new? The public knows that the state of its rivers is getting steadily worse, though pollution seems to be successfully combated in particular cases. In spite of the necessity of not hampering commercial undertakings, the public wants its rivers clean. If the demand is not yet very loud, it will grow louder, for there is increasing interest in the preservation of the country's amenities. When the demand is loud enough, something will have to be done. The task will be easier if tackled now.

COMPARATIVE ANATOMY OF THE CEREBELLUM.

THE Herter Lectures at the Johns Hopkins Medical School were given last winter by Dr. Iven Ingvar[1] of the University of Lund in Sweden. The first was entitled the Phylogenetic Continuity of the Central Nervous System, the second was devoted to a discussion of the function of the cerebellum, and the third dealt with the pathological changes underlying the phenomenon of the Argyll Robertson pupil. The chief interest undoubtedly centres in the first lecture. Phylogenetic continuity is an established principle of anatomy, but while the discovery of homologies in different species is often regarded as an end in itself, the principle is capable of being used as a means of elucidating obscurities in human anatomy, and Dr. Ingvar has thus used it in an endeavour to discover the primary anatomical divisions in some difficult parts of the central nervous system, particularly in the cerebellum and in the thalamus.

His comparative studies of the cerebellum were already well known to neurologists. In the human cerebellum the old anatomists found various divisions to which, without any knowledge of their significance or relative importance, they gave fanciful and picturesque names—vermis, pyramis, tonsilla, nidus avis, and so on—with which our memories are still burdened. Yet these names were for centuries only veils to cover ignorance and hampered rather than assisted the understanding of the organ's nature and function. In the nineties of last century the embryological studies of various English workers—Stroud, Bradley, Elliot Smith—brought a new knowledge of cerebellar anatomy, and with Bolk's comparative studies yet another advance was made. Bolk's merit is that he revealed in the cerebellum throughout the mammalian class a constant morphological system; he taught that in all mammals it was formed on the same uniform principles. In all mammals the deepest of the transverse fissures of the cerebellum is the "primary sulcus"—the sulcus which is the first to appear during embryological development, the mass in front of this sulcus Bolk called simply the anterior lobe and all that developed caudal to it he called posterior lobe. The anterior lobe is subdivided in all mammals into four lobules. The posterior lobe presents more difficulty; its rostral (or anterior) portion has the same plain pattern as the anterior lobe and Bolk called it the lobulus simplex. Behind the lobulus simplex two sagittal fissures divide the main mass of the posterior lobe into a medium portion (the inferior vermis), which Bolk called the lobulus medianus, and two lateral portions, the lobuli laterales (the cerebellar hemispheres of the old terminology). Ingvar has endeavoured to carry Bolk's work a stage further. Surveying the cerebellum throughout the vertebrate phylum he concluded that another sulcus separating off the most posterior part of the vermis, with its attached flocculi, was an elemental one. He consequently gave the name posterior lobe to the portion separated off by it, and the structures between it and the primary fissure he called the middle lobe. We may observe that Elliot Smith, from a study of the embryology of the cerebellum, had made a similar division nearly twenty years earlier. Ingvar's division, whilst nearly identical with Elliot Smith's, assigns the pyramis to the posterior lobe, whereas Elliot Smith's assigns it to the middle lobe; when we consider the difficulty of deciding among the neighbouring fissures which corresponds to a particular one in other animals, we may find guidance in the connexions between adjacent parts; the pyramis is connected on each side with the lobulus biventer (digastric lobe) which both authorities assign to the middle lobe, and if this connexion is at all intimate it seems probable that the pyramis also belongs to the middle lobe. That, however, is a relatively small matter and on the main lines there is substantial agreement. Supporting evidence for the division of the cerebellum in this way is afforded by the fact that the fibres which enter it are distributed according to the lobes thus described—those from the spinal cord to the anterior and posterior lobes, those from the pons to the middle lobe, and those from the labyrinth to the posterior.

Encouraged by the evident services of phylogeny to the study of the cerebellum, Ingvar went on to examine by the same methods the manner of division of the thalamus. Again giving his attention largely to the brains of birds, he recognised in them all the thalamic nuclei of mammals, the greatest difference between the two classes being the much stronger development of the lateral thalamic region in mammals. The most conspicuous formation in the avian thalamus is the nucleus rotundus and this in Ingvar's view corresponds to the nucleus ventralis of the mammalian thalamus; the homology, he finds, is again supported by the similar fibre connexions of the parts. That there should be such correspondence in the structure of the thalamus in the two classes and yet such enormous difference in the development of the cerebral hemispheres suggests that the thalamus is largely independent of the cerebral cortex and that its nuclei are laid down and developed without regard to cortical formations. The lecture concludes with a few paragraphs on phylogenetic continuity as seen in the cerebral hemispheres, but these are not based on Dr. Ingvar's own work and he scarcely develops the subject. Such a method of anatomical study is a fascinating one, and if it is rigidly controlled by every available means it is certainly likely to yield valuable results.

ICTERUS NEONATORUM.

THE pathology of jaundice occurring in the newly-born has been subjected to close study in recent years and its classification has been greatly improved. When syphilis, sepsis, and excessive fragility of the red blood corpuscles have been excluded, three ætiological possibilities remain to be considered. The case may be an example of "physiological icterus"; it may belong to one of the more severe familial forms, such as icterus gravis neonatorum; or, finally, the so-called congenital obliteration of the bile-ducts may be responsible. In the last-named group it has been well known for many years that a cirrhosis of the liver is also present, and Sir Humphry Rolleston is inclined to regard this as the initial lesion with obliteration of the extrahepatic ducts as a subsequent development. Following this teaching several cases have been reported in which congenital obliteration of the bile-ducts was diagnosed on the micropathology of the liver, though the extrahepatic ducts were quite patent. The condition known as physiological icterus neonatorum which occurs in about half the infant population has been attributed to the destruction of the excessive number of red blood corpuscles with which every infant is born. The difficulty of accepting this view has been the fact that every infant does not suffer from jaundice. Lately an attempt has been made to elucidate the condition by comparing the blood groups of the mothers and infants, and in a recent paper[1] Dr. G. Lenant and Dr. S. Biró enlarge on this question and also on the occurrence of isoagglutination phenomena in the blood of the newly-born. As far as a study of 100 cases by these authors will permit of generalisation, it seems to be established that severe icterus neonatorum is twice as likely to be present where agglutination between the mother's and the child's blood occurs as when this is not present. In another communication[2] to the same journal, Prof. C. de Lange, with the coöperation of Dr. A. K. W. Arntzenius, gives a very interesting account of familial "icterus gravis neonatorum," or as it is here called "icterus familiaris gravior." In these cases several children in the same family are born with an intense jaundice and usually survive only for a few days. Those who survive longer often develop curious nervous symptoms consisting of head retraction, spasticity of the limbs, and sometimes tonic contraction of the upper extremities. At autopsy there is no evidence of any fibrosis in the liver, and very little of degenerative or other changes in the liver cells. Most of the organs are deeply bile-stained, but in the brain there is especially deep staining of the basal nuclei. The blood picture shows signs both of gross destruction of blood and of regeneration. Three theories have been advanced to account for this rare condition—it might represent a disease of the blood-forming apparatus of the child, it might result from toxins acting in utero and arising either from the mother or from the fœtus itself, or it might be due to hæmolysis of the child's blood caused by the interaction of agglutinins and isoagglutinins. Some support is lent to the toxin theory by a case of severe congenital œdema, "hydrops universalis fœtus," described by Prof. de Lange. The mother was very œdematous with albuminuria, and corresponded to the "toxæmia of pregnancy" type of case. The blood picture of the infant and the section of liver obtained at autopsy were exactly similar to those seen in the cases of icterus gravis, and, moreover, a connecting link is found in reports from the literature of children born in a condition of generalised œdema to mothers whose previous infants had fatal icterus. This sequence suggests that icterus gravis neonatorum is due to some toxin transmitted from mother to child. Dr. W. Scholtz[3] reports a family in which the two first children were slightly jaundiced at birth; in each the jaundice became intensified on the fourth day and both infants died a few days after. On the assumption that the intensification of the jaundice on the day after the secretion of milk started was more than a coincidence, two children born later to the same parents were artificially fed. These showed only a mild transient jaundice and progressed favourably. A family history of asthma and of intermarriage was noted. Unfortunately the cutaneous reaction of the surviving children to the mother's milk was not tested. The obscurity surrounding various types of congenital jaundice is lifting; if further study of the new views leads to their confirmation, light may be thrown on the pathology of certain other congenital abnormalities.

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[1] Bulletin of the Johns Hopkins Hospital, vol. xlii., No. 6, December, 1928.

[1] Jahrbuch f. Kinderheilk., May, 1929, p. 77.

[2] Ibid., p. 1.

NICOTINE IN CIGARETTES.

THE practitioner is handicapped in forming an opinion of the clinical effects of smoking by the lack of scientific data concerning the actual toxicity of tobacco in the various forms in which it is taken. Some useful work has lately been done by Dr. A. Winterstein and Dr. Ernst Aronson, of the Department of Agricultural and Physiological Chemistry at the Technical High School of Zürich, on the actual and effective nicotine content of various kinds of cigarettes.[4] They point out that previous estimates have been compromised by the absence of a satisfactory method of measuring nicotine, but that Fühner's method gives readings of great accuracy; he estimates with a cymograph the muscular contractions of a leech under the influence of nicotine. They found that the toxicity of a cigarette is determined not only by its nicotine content but also by the variety of its tobacco, and its humidity, shape, and density. Those who inhale absorb three times as much of the poison as those who do not. Short, thick cigarettes produce twice as much nicotine as long and slender ones, and loosely rolled cigarettes 30 per cent. more than those which are rolled tightly. The nicotine given off by damp cigarettes is 30 per cent. less than that produced by dry ones. The quantity of nicotine which reaches the mouth therefore depends on the resistance offered to the smoke in its passage through the tobacco; if this resistance is low the amount passed will be high. Dark and strong tobacco yields more than light. An important feature of the investigation was the discovery that "hygienic" or "denicotinised" cigarettes contain just as much of the alkaloid as ordinary ones, and that a cotton-wool filter does not diminish the quantity in the smoke. It was found impossible to reduce the output of nicotine by chemical means. The authors suggests that legislation should be passed to restrict the use of the term "nicotine-free" or "low nicotine" to tobacco containing not more than 0·8 per cent., which would deliver at the mouth not more than 0·4 mg. of nicotine per gramme of leaf. They point out that so far it has not been possible to produce a tobacco with this low content that has an acceptable aroma, but that selective cultivation should solve the difficulty. It is, they say, a fact that certain tobaccos contain only one-third to one-seventh of the quantity of nicotine present in a high-nicotine brand, and they hope that propaganda will encourage a demand which will make the necessary research worth while. They make no mention of other toxic bases in cigarettes, such as pyridine, and presumably their method of measurement gives the mass result of all the toxic constituents. Nevertheless their tables, which are very full, will provide valuable information for those interested in this question.

TREATMENT OF PULMONARY TUBERCULOSIS WITH SANOCRYSIN.

IN November, 1923, before Prof. Möllgaard had published his investigations into the effects of sanocrysin on tuberculous animals, Dr. K. Secher began to test this drug in human beings. Since then he has continued to study its effects in man, and his latest publication, in *Nordisk Medisinsk Tidsskrift* for June 1st, includes a summary of the results achieved in the 322 patients hitherto treated. He classifies them in three groups, according as they (1) became well, (2) became better, or (3) showed no change or became worse. Among the 191 patients in the first group, there were 53 whose disease was slight, as many as 45 of these 53 being sputum-negative. There were also 41 whose disease was severe, but even among these cases there were as many as 19 sputum-negative patients. In the same group were 70 cases of pleurisy, 14 of glandular tuberculosis, and 13 of tuberculosis in children under the age of 15. In the second group, which contained 68 cases, there were 55 in which the disease was severe, 47 of these 55 being sputum-positive. There were also 6 cases of very severe disease, 3 of pleurisy, and 4 of tuberculosis in children under the age of 15. In the third group, which contained 63 cases, every case was classified as one of very severe disease. Dr. Secher has come to the conclusion that this class of case is unsuited for chemotherapy. In several of these cases the treatment was attempted as a therapeutic essay or as a consolatary expedient. "This group," he says, "can be entirely eliminated in the future." An unsatisfactory feature of Dr. Secher's material is the lack of controls. Of his 73 patients suffering from pleurisy, 70 were cured, and three became better—a happy sequel, the significance of which must, however, be judged in the light of the fact that the overwhelming majority of such patients get well and keep well with nothing more specific in their treatment than prolonged rest and fresh air. The same criticism is applicable to the 53 sputum-negative patients whose disease was slight, and whose recovery, it is implied, was connected with their treatment with sanocrysin. More convincing than Dr. Secher's statistics are his records of isolated cases, and no doubt his continued advocacy of this treatment depends chiefly on his clinical evaluation of a large number of individual cases. His discussion of the dosage resolves itself into a criticism of the timid procedure which is "a tuberculin therapy and has nothing to do with sanocrysin treatment," and of a rule-of-thumb schematic procedure. He recommends the most cautious individualising, the graduation of the dosage according to the patient's weight, the character and extent of the disease, and the nature of the reaction following the previous injection. He usually begins with a dose of 0·5 g.—i.e., approximately 0·01 g. per kg. of body-weight. At the second and third injections, 0·75 g., or 1·0 g., is the usual dose. The intervals between these three first injections are usually two clear days, the later intervals being from five to six days or even longer if the reactions point this way. The injections are continued until what Dr. Secher calls "effective doses" no longer provoke a reaction. The usual number of injections is five or six, but he sometimes gives up to ten, the average dose—"a really effective dose"—in one series of cases being 0·0167 g. per kg. body-weight. Dr. Secher's review of the results achieved by various clinicians suggests very explicitly that pessimism may be correlated with timidity of dosage, the curve illustrating the transition from pessimism to optimistic confidence in sanocrysin running parallel with the rising curve of the dosage.

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[3] Jour. Med. Assoc. of South Africa (B.M.A.), May 11th, p. 252.

[4] Schweiz. Med. Woch., May 25th, 1929, p. 550.

SCARLET FEVER CARRIERS.

SEVERAL outbreaks of scarlet fever ascribed to carriers have recently been described by Dr. Ruth Tunnicliff and Dr. T. T. Crooks.[1] In the first epidemic the infection was introduced into the ward of a children's hospital by a boy who was admitted apparently during the incubation stage of the disease for he developed scarlet fever three days afterwards. Another case was noted on the same day and still another nine days later. The usual measures were enforced with regard to quarantine but further cases nevertheless appeared in the same ward on the twelfth and thirteenth days after the last case. Throat cultures were now taken from everyone in the ward, including doctors, nurses, and wardmaids, and hæmolytic streptococci, said to be specific for scarlet fever, were isolated in almost pure culture from a doctor and a nurse who had had a sore throat about a fortnight before. Further examination showed that at the end of five days the streptococci had disappeared from the throat of the doctor, but the subsequent history of the nurse is noteworthy. She was allowed to remain on duty in the same ward and about a month later three new cases developed among the patients, although face masks were now being worn by the nursing staff. On the occurrence of these cases she was still found to be harbouring a hæmolytic streptococcus and was taken off duty from the ward and given work which only permitted contact with other nurses. At the end of about another month a colleague who had been in the habit of visiting her room developed scarlet fever, and at this stage her throat was examined by an ear and throat specialist. Chronic tonsillitis was found and the specific streptococci were isolated from the tonsils when they were removed. After operation throat cultures failed to reveal the presence of hæmolytic streptococci and no more cases of scarlet fever appeared in the ward. Tunnicliff and Crooks's paper also gives details of two family outbreaks of scarlet fever in which the only possible contact of the children with the outside world was by means of the father, who was in each case found to be harbouring a hæmolytic streptococcus of the type specific for scarlet fever. Their whole argument clearly rests on their claim to be able to distinguish this specific strain, for this is the basis of proof that the persons described as carriers were accurately so determined. Epidemiological evidence is overwhelming in favour of carriers, both healthy and convalescent, being responsible for the spread of scarlet fever, and since the streptococcal ætiology of scarlet fever was established the epidemiological indications have fitted in very accurately with what we know of the distribution and habitat of the hæmolytic streptococcus. Absolute proof awaits better classification of the streptococci, but in this connexion it may be noted that Miss Tunnicliff[2] has previously described a method using the opsonic technique for differentiating the scarlatinal streptococcus. It does not seem difficult to carry out and she says that it is as quick and accurate as the cultural diagnosis of diphtheria. If this work can be confirmed it will go far to simplify the diagnosis of the disease and the determination of carriers, and will thus give good ground for administrative action which is at present based largely on strong suspicion.

COLLOIDS IN MEDICINE.

THAT branch of science which is concerned with the properties and behaviour of colloids originated in biological investigation and many of its most notable advances have been made by those engaged in such work. This is not surprising if we consider how great a part is played in the life of animal and vegetable organisms by systems which are essentially colloidal. On the one hand, the microscope reveals the intricate organisation of the tissues, and on the other, chemical and biochemical studies show the complexity of the continuous changes in them. These changes, often bound up with the microscopical structure, are nearly all incompletely understood, and at present it is seldom possible to reproduce them independently of life. This is particularly true in the vast field of enzyme action, which is held to account for many of the vital processes, and seems to be much more complex than even the most intricate example of inorganic catalysis. Despite a wealth of brilliant research into its nature, the great problem remains unsolved—namely, the way in which the various groups of enzymes act so specifically, each promoting only one type of chemical change or synthesis and each attacking only a certain (often highly specialised) type of chemical compound, leaving unchanged other substances which may be almost identical chemically. New evidence has accumulated of late; comparison with organic catalysis has yielded many suggestive analogies; but the problem is so intimately connected with the peculiar properties of various groups of colloids that it seems clear that advance in the knowledge of enzyme action must go hand in hand with the advance of colloid chemistry.

The theory of enzyme action, though exceedingly important, is only one aspect, however, of the biochemistry of colloids. The ubiquity of colloidal phenomena in the body is indeed remarkable. It would, of course, be absurd to assign to colloids the position of being the sole factors of life, but they are nevertheless concerned, more or less, in every manifestation of life. In a recent book[3] some of the applications of colloids to biology and medicine are reviewed by a number of biologists, chemists, physicists, and bacteriologists who have for the most part made a special study of colloids as applied to some branch of medicine or of its allied sciences. Biology and medicine, and botany also, are fundamentally concerned with cell behaviour, involving the study of the "permeability of the membrane" and the properties of protoplasm. A great number of investigations bearing upon these questions have been made, outstanding observations beginning with those of Pfeffer and De Vries and their original concept of the osmotic nature of the living cell. Some of the difficulties of this concept were known to its authors, for by producing precipitation of tannin in certain cells by diffusion into them of various substances they showed the untenability of the simple concept of the cells as a small sac of fluid enclosed by a semi-permeable membrane, impermeable to all dissolved substances but permeable to water. Indeed it was soon clear that the original view of the strict osmotic construction of the cell would have to be abandoned, for on this view the cell could not take up food or rid itself of its excretory products. As an alternative it was often suggested that the term "semi-permeable" must be allowed a more flexible meaning, and must be supposed to be "permeable" to the things necessary to life or permeable only in one direction. As Martin Fischer remarks in the book to which we have referred: "A living cell is, however, capable of taking up and giving off water and of taking up and giving off dissolved substances and these two things may occur at different times or at one and the same time, and with the solvent and dissolved substances moving in the same direction or in opposite directions." To explain these phenomena is by no means easy even to-day. Many of the theories proposed are based on the idea that "imbibition" might play some part in the process. Fischer, who has thrown much light on water absorption by living cells under physiological and pathological conditions (œdema), thinks that there are two main factors quite distinct from osmosis—namely, the reaction of the fluid and its salt concentration, taking into account the nature of the particular salt involved. The exchange of water is largely reversible, and urea, pyridine, amines, and certain other substances increase the hydration capacity in a way quite distinct from the action of acids and alkalis.

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[1] Jour. Amer. Med. Assoc., May 4th, p. 1498.

[2] Ibid., 1926, lxxxvii., 625.

[3] Colloid Chemistry: theoretical and applied. By selected international contributors. Collected and edited by Jerome Alexander. Vol. II. Biology and Medicine. New York: Chemical Catalog Company. Pp. 1029. $15.15.

These few examples show that the facts are being accumulated, though very slowly. There are theories to explain some of the facts but none to explain them all. Undoubtedly the slowness of advance since the days of Pfeffer is due to the need for a new science in the form of colloid chemistry, and this is now being developed to explain the phenomena.

THE TREATMENT OF POLYCYTHÆMIA.

NOT long ago Dr. W. Mackay drew attention in our columns[1] to the uses of phenylhydrazine in reducing the red cells of the blood in polycythæmia. In both his cases nothing but good came of the treatment, but toxic effects have been from time to time reported by other observers. In this country cases of polycythæmia are so rare as to make it hard for any one person to gain enough experience to lay down rules about dosage and general management. In America the diagnosis seems to be made more often, either because the disease is commoner or because diagnosis is more lax. The fact that certain cases have been recorded with red cell counts of only just over 5 millions favours the latter alternative, but in any case phenylhydrazine has been used on the human subject a good deal more frequently in America than in this country. As a result of their own experience and that of others Dr. H. Z. Giffin and Dr. H. M. Conner,[2] of Rochester, Minnesota, have laid down certain general principles to be followed in giving this drug. They point out that a very common cause of disaster after its administration is thrombosis, either of the mesenteric vessels or elsewhere, and on this account they lay stress on the importance of doing everything to prevent stagnation of the circulating blood. To this end the treatment is preferably ambulatory; if in hospital the patients should be kept out of bed as much as possible, or if this cannot be done, they should be given massage and passive movement. For the same reason the treatment should be used with caution in patients showing signs of advanced arterio-sclerosis. They consider that large doses are unnecessary and suggest an initial dose of 0·1 g. three times daily. This may be continued until from 1·5 to 3·5 g. have been taken according to the degree of blood destruction. Thereafter the drug should be given in short courses at intervals determined by the rate of red cell production. It is stated that patients soon learn the dosage which suits them and are able to judge for themselves when further courses are necessary. The treatment has its dangers, but has until lately offered almost the only satisfactory method of combating a disabling and dangerous condition. The newly introduced treatment by spleen extract promises to be less dangerous, but it remains to be seen whether it is equally effective.

RENAL STONES.

IN submitting a detailed analysis of cases of renal and ureteric calculus, Mr. A. R. Thomson[1] says that when he was appointed chief of the genito-urinary department of Guy's Hospital in 1910 he decided not to publish results until the department had been in existence for some time. As a basis for his report he has collected the post-mortem records at Guy's from the year 1890–1900, inclusive, and in order that "a curb might be placed upon any unfair opinions gathered from the records of one hospital," he has read through the case-sheets of nearly 13,000 cases treated at the Victoria Hospital for Children and at the London Hospital. His investigation has, therefore, been extremely thorough and his conclusions may be accepted with complete confidence. Among them are the following: (1) The incidence of stone is about equal in the two sexes, but in elderly people more males are affected than females. (2) There is a slightly greater number of stones on the right side than on the left. (3) The large number of bilateral stone formations, which is about one-third of the total number of cases, points to the seriousness of this condition. (4) Bright's disease is not uncommonly diagnosed when there is a renal or ureteric stone present, and a stone is often the cause of Bright's disease. Bright's disease following on stone formation is more common in males than in females, but bad kidneys, such as bilateral pyonephrosis, are more common in females than in males. (5) Stone may form in the urinary tract as a result of some wasting disease. (6) The commonest place for a stone to be found is the pelvis of the kidney. (7) Compensatory hypertrophy of one kidney, when the other is diseased, is not nearly so common as is generally supposed. (8) Stones may recur after operations for their removal, but this, Mr. Thomson thinks, may be due to carelessness on the part of the operator.

VACCINE THERAPY IN AMERICA.

IT is a little unfortunate that the one word "vaccine" should be employed in different senses. It was applied to the great and established discovery of Jenner in the prevention of small-pox; it was used to denote Wright's contribution to the prophylaxis of typhoid and allied infections; and it is used in relation to the treatment of infections by dead organisms. These three clinical methods do not stand on the same footing, but they have all given rise to extravagant claims at one time or another. The treatment of infections with vaccines, which is still in the experimental stage, is particularly open to abuse at the present time because so many conditions of unknown origin are put down to focal sepsis. When we hear of a case of soft corn of the foot treated with a streptothrix vaccine, and a case of lymphadenoma treated with a polyvalent fæcal vaccine, we feel that the patient is entitled to know that his medical adviser is putting his money on an outside chance, to say the least of it.

The question arises how far clinicians do, in fact, make use of vaccines is one to which no answer can be given in this country, although the price-lists of commercial firms show that there is a constant demand. In the United States, however, Hektoen and Irons[1] have taken the trouble to write to over three thousand medical men in the hope of finding out. Their report is surprising, for the percentage employing vaccines, usually less than five, does not exceed 25 in any of the four groups into which the respondents are divided, and in furunculosis alone is that figure reached. The replies show almost complete unanimity in refusal to use *Bacillus coli* vaccines; only 0·25 per cent. treat colitis with vaccines, and no one employs them for tuberculosis or epilepsy. Hektoen and Irons point out that from 1906, when Wright introduced his vaccine treatment, to 1912, there was a large output of papers on the subject. Since then the papers have been fewer and apparently the method has fallen into disfavour. In the latest edition of Kolle and Wassermann's handbook, although much is written on it, significantly little is claimed. On the whole, however, it seems to be in greater disrepute in America than in this country or in Germany where questions are not uncommonly set in qualifying examinations on the "proved" values and methods of vaccine therapy. "Non-specific" or "shock" therapy is not considered in Hektoen and Irons's report, but the country in which Petersen has worked may be said to be the originator of this method, and we may suppose that it is widespread there. The use of such preparations here is undoubtedly spreading, and Ledingham has expressed the opinion that, where vaccines in treatment are efficacious, the result is due to non-specific reactions. Few would deny that, in staphylococcal skin infections, vaccines are often of value, but preparations of manganese give very similar results.

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[1] THE LANCET, April 13th, 1929, p. 762.

[2] Jour. Amer. Med. Assoc., May 4th, 1929.

[1] Guy's Hospital Reports, April, 1

The exaggerated statements often made on behalf of vaccine therapy make this questionaire of interest, but it is unlikely that such an investigation will be made in England, and, after all, what the American doctor does is no more evidence of scientific fact than what the soldier said. It is, however, a straw showing which way the wind is blowing in the United States, and there are those who hold that a wind from the same quarter would not be disadvantageous over here.

MATERNAL MORTALITY.

Dame Janet Campbell, who has accepted an invitation to go out to Australia to give the benefit of her experience to the Commonwealth Government, was entertained on June 17th by the President and Committee of the United Empire Circle. Replying to Viscountess Elibank, who spoke of the widespread appreciation of her services, and expressed a hope that her mission would bring lasting help to Australia, she pointed out that maternity and child welfare was not a new subject in that country, and said she hoped to gain more from her visit than she expected to be able to give. In Australia, as in this country, maternal mortality was one of the most pressing problems, and it was a complex problem which could not be solved by any single line of approach, but only by the united action of all interested. A great deal of educational work was needed among the mothers themselves, and also among medical students and midwives, to equip them to meet the difficulties they might have to face. It should always be possible to summon the help of a consultant in time of need, for many maternal deaths would be avoided if the mother could have skilled attention at the right moment. Increased education and coördination would tend to bring about a reduction in the death and damage-rates among mothers, and also in the early infant mortality-rate associated with childbirth. Children between the ages of 1 and 5 years were at present somewhat neglected because no official body was responsible for them, and we must consider how best to watch over those children so that they might arrive at school age in a healthy condition. In the course of subsequent speeches the Countess of Birkenhead said that at the General Lying-in Hospital in the last ten years 26,198 confinements had been attended in the hospital and on district, the maternal mortality-rate being 1·6 per 1000; and Viscountess Erleigh paid a testimony to the invariably wise and far-seeing advice which Dame Janet had given in regard to plans for day nurseries.

CHEMISTRY IN CZECHO-SLOVAKIA.

Bohuslav Brauner has for many years been known by name to chemists as a professor at the Bohemian University of Prague, as well as an authority on atomic weights and general chemistry. It is, therefore, with interest that we welcome as fruits of his labours the appearance of an early number of the first annual collection of Czecho-Slovak chemical communications, published under the patronage of the Regia Societas Scientiarum Bohemica. The number contains eight papers by workers at the Charles University and the Polytechnic at Prague and at other similar institutions. Written in French or English, they include records of sound work in inorganic, physical, organic, and analytical chemistry. Not only the papers themselves but even the advertisement columns afford evidence of the intense desire of a country recently made autonomous to tell the world in languages better known than Czech that it is taking its place among the learned nations.

A MEDICAL "TALKIE."

Mr. Swift Joly will preside at the last meeting for the present session, of the Section of Urology of the Royal Society of Medicine, to be held on Thursday, June 27th, when Sir John Thomson-Walker will give a cinematograph demonstration showing a "talkie" film. This is a demonstration by way of experiment, but we may have here the beginning of an important development in teaching. We understand that the film showing the operation will explain itself audibly as the operation proceeds, but that this does not imply that it will be a "close up" of the operator. The innovation is sure to attract a large audience.

The Cavendish Lecture of the West London Medico-Chirurgical Society will be delivered at 8.15 P.M. to-day, Friday, June 21st, at the Kensington Town Hall, by Prof. Cl. Regaud, of the Radium Institute, Paris, his subject being Progress and Limitation in the Cure of Malignant Disease by Radium. A reception will be held from 7.30 P.M. onwards, and at 8 P.M. the Society's triennial gold medal will be presented to Sir Ronald Ross, F.R.S.

The University of New Brunswick has conferred the honorary degree of Doctor of Laws upon Sir Charters Symonds, consulting surgeon to Guy's Hospital, who was born at Saint John. Sir Charters, who was prevented from attending the Encænial proceedings, signalised the occasion by founding a prize to be known as the James Symonds prize in history in honour of the original English settler at the mouth of the Saint John River.

National Campaign against Rheumatic Diseases. At a conference held in London last November an executive committee was appointed to draw up a constitution for a national campaign against rheumatism. This executive committee, of which Sir Thomas Horder is chairman, invites members of the medical profession to attend a meeting to be held at the house of the Royal Society of Medicine, 1, Wimpole-street, London, W., on Wednesday, June 26th, at 5 P.M., when a report on policy and constitution of the campaign will be received and a council will be elected. The hon. secretary of the committee is Dr. M. B. Ray, 6, Bentinck-street, W. 1.

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[1] Hektoen, L., and Irons, E. E.: Jour. Amer. Med. Assoc., March 16th, 1929, p. 864.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XXXIV.

THE INTERPRETATION OF MENTAL TESTS.

I.*—PRELIMINARY CONSIDERATIONS.

PROBABLY very few of the problems of diagnosis and prognosis presented to the busy practitioner fill him with so profound a sense of his own limitations as that which faces him when he is asked by an anxious parent to give an opinion upon the mentality and the future prospects of a child or a young adolescent. General medical education, which provides the student with some knowledge, more or less vague, of the idiot and the imbecile, which he groups in his mind confusedly and erroneously with the insane, has omitted to inform him to any degree regarding the much larger class of the feeble-minded. In his general work after graduation he has but occasional opportunities of becoming acquainted with the type, in contrast to the children's specialist and the school medical officer, and as the feeble-minded generally do not present so marked physical traits as the idiot and the imbecile, he may be tempted to express favourable opinions regarding children who, before many years have passed, will demonstrate by their failures how uninformed the medical opinion had been.

At the outset the practitioner should beware of the temptation to utter comforting platitudes about "late development." One does not deny that late development occurs, but in the writer's experience it is extremely rare, and when there is a clear history of lateness in teething, sitting up, walking, talking, control of bladder and bowel, together with obvious signs of a mentality from 2 to 3 years below the normal for the child's age—we are assuming a child of about 7—it is safe to anticipate that there is a permanent lateness, becoming later every year, a permanent subnormality, that is to say, with all that it implies.

One of the practitioner's difficulties is that in these cases, as in the insane, he has almost entirely to abandon the search for physical signs which are his sheet-anchor in his routine daily work. There are, of course, a few definite types of deficiency which can be diagnosed by physical signs—the microcephalic, the hydrocephalic, the mongol, and the cretin being the chief of these. Their physical description does not concern us here, and in any case prognosis regarding their mental possibilities need give but little difficulty. The microcephalic rarely rises above the level of the low-grade feeble-minded. The mongol is always an imbecile, but mongoloid types exist with less marked physical features, who may rise a little higher. He is not always the last child of a mother exhausted by numerous pregnancies of the text-books. Of the cretin it should be said that while thyroid treatment may transform him physically into at least a semblance of normality, no such transformation mentally need be expected—he remains a defective. Hydrocephalics vary very greatly in their mental capacities. These special types constitute but a small percentage of defectives.

The physical "stigmata" on which at one time so much emphasis was laid as signs of inherent mental or moral degeneracy may also be passed over with but brief mention. Their significance singly is negligible, for their single occurrence is not infrequent in normal persons, but when they occur in any number from three upwards, they assume significance, not so much for diagnosis of the individual as for that of his family as probably degenerate. Our main reliance for guidance must, then, be found elsewhere than in the physical, and it will be convenient to pursue our lines of search in the order of: history, observation, and tests. Further, as consultation on mentality is most frequent either at the early ages from infancy to 7 years, and at the period of early adolescence, these two periods require to some extent separate treatment.

THE EARLY YEARS.

History.—By history is meant individual history. Family history, however valuable, when obtainable in reliable form, as indicative of the presence of lunacy, deficiency, epilepsy, paralysis, functional nervous conditions as hereditary factors, is of no more value for a diagnosis of the individual than a plurality of stigmata. To appreciate the significance of individual history, it is necessary to keep before our minds certain norms of development as a guide to interpretation. Some of the main stages of physiological growth may be briefly epitomised.

Stages of Physiological Growth.—Within the first three months after birth a child, besides showing normal activity of the reflexes essential to life, should begin to take notice of objects affecting his various senses—noises, bright lights, tastes, and in some vague degree the more immediate objects in his environment—with, at the end of the period, some capacity to follow a bright object or turn towards a sound. The following three months sees considerable development of the power of seizing and grasping objects, with, towards 6 months, some little perception of their relative distance. At 6 months he can sit up, but will still require support, and his mother or nurse is now a fairly well-recognised entity. At 9 months a normal child can sit up without support, and will be crawling or otherwise propelling himself along the floor, and may even stand and try to step. About this time also are the first beginnings of imitation, but it is not a marked trait until the end of the year. Muscular coördination is now more reliable, both as regards grasp of objects and control of his own body movements. At 12 months he should walk with help, he will play with a spoon and a saucer and with blocks, but cannot construct; eye accommodation is now under control.

At 18 months he can walk alone, and even try to climb a stair, try to put on his shoes, and attempt to feed himself with a spoon. Bowel control should now be fairly reliable, followed at 2 years by bladder control. By 2 years he will build up a tower with three or more blocks. He can put on his shoes at 3, carry a frangible object, and open a door. At 4 he is mastering certain of the elementary processes of dressing—buttoning clothes and fastening shoes.

Language and Articulation.

Coincident progress in speech must be noted. After the early babbling stage comes, among other imitations at 8 or 9 months, the imitation of sounds heard, at first with no idea of meaning. Before 12 months a child should begin to understand what is said to him and to obey commands. Of use of actual words by himself at 12 months we expect little but "mama" and "dada" and a few other common baby words. A few months later he is appreciating the meaning of more words, but up to 18 months his own spoken vocabulary is extremely limited. The next six months, however, sees great extension in this direction, coupled with greater understanding. By 2 years he may have acquired as many as 200 words, and is a persistent imitator, so that echolalia is a marked feature at this stage. From this time the interaction of language and intelligence upon one another becomes more definite, and in the third year he is becoming acquainted with first the similarities of different objects, later their differences, and developing concepts consequently of wider and wider significance. Short sentences in place of single words, negatives, plurals, pronouns, parts of verbs make their appearance, and by the end of the third year that most significant of all mental advances, the use of the pronoun "I" is, in a normal child, well established. At the same time—and this is of importance—articulation should be nearly perfect.

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* Part II., the Significance of Accepted Tests, will appear next week.

Abnormalities in Development.

With these norms before him the assessor of intelligence has a fairly satisfactory basis for a diagnosis, provided that he can obtain approximately reliable data for the individual child before him. Retardation of teething, sitting up, and walking may only indicate rickets, of which there will be other signs, but when all these are combined with lateness in "taking notice" in infancy—a point soon discovered by an experienced mother—with absence of the normal babble, retardation of early efforts at speech, with, for a prolonged period, great difficulty of articulation, and lateness of other normal activities described, with late control of bladder and bowel, then there is a strong a priori case for a diagnosis of deficiency.

In the case of any child up to 3 and a markedly subnormal child to 5 (or even later) practically no other method of diagnosis but this and the observational is available, but at those early ages diagnosis must always be guarded. Idiocy and imbecility may be readily recognised then; such a child would probably not be talking at 3, and not very much and not distinctly at 5—to take only one sign as an example. But feeble-mindedness at these early ages is not so readily diagnosed. At any age up to 6 or 7 to say that a child who started to walk at 18 months and is only just beginning to talk at 2 to 3 years is not feeble-minded, and will be all right later, would be dangerous. Indeed, we may go further and say that a quite definitely feeble-minded child may only show a retardation of a few months in each of the activities above mentioned. More usual, perhaps, is a slight retardation in some and a marked retardation in one or two—say, talking or acquisition of cleanly habits. These inequalities are common in the feeble-minded, and the practitioner would be well advised to adopt a "wait and see" policy, a policy which, after all, he has to adopt in reference to many other diseased conditions. It is seldom indeed that a certifying officer will commit himself to say of any doubtful case until the age of 7 that the child is not feeble-minded.

With children of older ages the questionaire may be extended to present conditions—the child's ability to dress and wash himself, to bring a number of errands correctly by memory only, his play activities and hobbies, his propensity to play with children of his own age or younger, to be led by others, to defend himself against others. And, above all, a comparison either from the parents' own information or by actual testing, between him and a younger member of the family (if any) may be illuminating. In obtaining all this information, the practitioner—if he is the regular family doctor—has an advantage over the official certifying officer in that he has probably had opportunities of observing the growth of the child, and cannot, therefore, be so readily imposed upon by a parent anxious to cover up the facts.

Observation.

Much may be learnt by careful observation, and in the case of very young or very low-grade children it is practically the only method of examination that is possible. A vacant expression, a slouching posture, a clumsy gait are readily noticed. So also are rocking movements, biting nails, sucking the thumb, and other habitual purposeless movements, but they are not very common above the imbecile grade. Alertness and quickness to "take notice" or the opposite are usually obvious, and the child's ability to walk and to articulate clearly; his own attempts at spontaneous speech are often of significance. An abnormal amount of fidgetiness and restlessness in such degree that the child is on the move all the time, handling everything he sees, but only for a moment, distracted by the slightest interruption, is characteristic of one type of defective—the unstable. At the other extreme is the stolid type whom it is difficult to rouse to any activity, physical or mental. It is, of course, in the mass that all such signs find their meaning. They are, however, never all present—articulation, for example, is sometimes almost perfect even in a young imbecile.

H. HERD, M.A., M.B., Ch.B. Edin.,
Senior Assistant School Medical Officer,
Manchester Education Committee.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. F. Cock is placed on the Retd. List with rank of Surg.-Capt.

Surg. Lt. J. K. G. Way to *Victory*, for R.N. Infirmary, Portsmouth.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Sub-Lt. J. O. Clyde to be Surg. Lt.

Proby. Surg. Sub-Lt. C. Seeley to *Victory*, for R.N. Hospital, Haslar, for training.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. H. H. Leeson, R.A.M.C., Res. of Off., to be Maj., whilst re-empld. under Art. 507 (b), Royal Warrant for Pay and Promotion, 1926, and relinquishes the rank of Lt.-Col.

The undermentioned Capts. to be Majs.: W. Bird, D. Cran, A. R. Ross, O. D. Jarvis, A. C. Taylor, R. Johnson, P. R. O'R. Phillips, T. H. Twigg, A. H. Clarke, D. J. H. Jones (prov.), J. K. Holland (prov.).

Lt. F. Welsh resigns his commn.

G. R. M. Apsey to be temp. Lt.

ARMY RESERVE OF OFFICERS.

Lt.-Col. J. D. Kidd to be Lt.-Col.

TERRITORIAL ARMY.

Lt.-Col. A. P. Watson to be Bt.-Col.

Capts. E. R. Woodroofe and A. H. Richardson resign their commns.

H. V. Ingram to be Lt.

Lt. E. White to be Capt.

2nd Lt. A. T. B. Dickson (late 7th Bn. H.L.I., T.A.) to be Lt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Capt. N. R. Rawson, from Active List, to be Capt.

INDIAN MEDICAL SERVICE.

Capts. R. S. Aspinall and Gangadrum Venkataswami Ram Mohan to be Majs.

P. J. Walshe, A. M. Sheridan, and J. H. Boultbee to be Lts. (on prob.).

Col. A. Spitteler and Lt.-Col. G. Fowler retire.

As will be seen from our advertisement pages the Secretary of State for India proposes shortly to make a certain number of appointments to permanent commissions in His Majesty's Indian Medical Service.

ESSEX PUBLIC MEDICAL SERVICE.—The fifth annual report (for the year 1928) of this Service shows that it provides increasingly for medical attendance on the families of insured persons. The number of subscribers rose from 14,594 in 1927 to 16,040 (7454 adults and 8586 children) in 1928, and their payments from £9427 to £10,446. The number of new books issued to subscribers during the year was 1904, and at the end of the year there were 8048 books on which payments were being made. The maximum remuneration of individual doctors during the year was £371 in a metropolitan district, £720 in an urban, £244 in a semi-rural, and £231 in a rural area. The balance-sheet affords more cheerful examination than in any previous year for the excess of liabilities over assets is now only £132, with a prospect of disappearance next year. The loan from the National Defence Trust (originally £400) has been reduced from £400 to £300, and the doctors' loan from £100 to £55. The Service, whose offices are at 108, City-road, London, E.C. 1, has all the signs of a going concern.

LORD DAWSON OF PENN.

LORD MOYNIHAN.

RT. HON. C. ADDISON
(Wiltshire: Swindon).

DR. ETHEL BENTHAM
(Islington, East).

SIR GEORGE BERRY
(Combined Scottish Universities).

DR. A. VERNON DAVIES
(Lancashire: Royton).

MAJ. WALTER E. ELLIOT
Glasgow: Kelvingrove).

DR. ROBERT FORGAN
(Renfrew, West).

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DR. JOSEPH HUNTER
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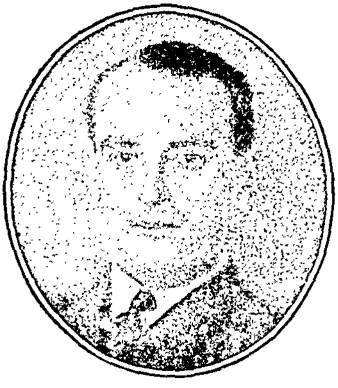

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MEDICAL MEMBERS OF PARLIAMENT.

Special Articles.

THIRTY YEARS OF SANATORIUM LIFE.*

BY ESTHER CARLING, M.D. BRUX., L.S.A.,
CHIEF MEDICAL OFFICER, BERKS AND BUCKS JOINT SANATORIUM.

THE coincidence of the Reading Pathological Society's visit to the Berks and Bucks Joint Sanatorium with the completion of 30 years of its existence suggests a backward glance and an inquiry as to how far the system still merits the confidence of the profession which feeds it.

The First Phase.

Systems of treatment develop from small flexible experiments into the hard concrete of the established order of things; with the acquisition of property, the appointment of officials, and the fencing around by legal documents an organisation comes into being which is very resistant to change. We have seen in the question of poor-law reform that, even when a Royal Commission has recommended action, over 20 years can elapse before the established order can be shaken. We see also how very slowly the structure of administration concerning mental disease is becoming modified. It is therefore surely wise to consider periodically the actual and relative values of any part of a system that has been on trial for a reasonable time, particularly if it happens to be a costly and exacting part.

Few practitioners will now remember the wave of interest that caught both the profession and the reading public when, late in 1898, a chemist named Gibson published in the *Nineteenth Century* an account of a cure for consumption which he had undergone in the Black Forest. This was followed by the experiences of several English medical men, and a rapidly spreading cult began for treatment on so-called Nordrach lines. Certain extravagances of Teutonic origin were at first included, and the overfeeding and lack of nursing of the Black Forest progenitor were part of the earlier English institutions. In 1899 several private sanatoriums were started, mostly by doctors who had themselves undergone the cure. The common-sense of a great deal of the system gained rapid support, and in a few years demand was forthcoming that the working classes should share the benefits. Here and there a specially wide-awake borough council or board of guardians made application to private institutions to start an industrial branch; employers asked for treatment for their servants or workpeople, and the demand for beds became insistent. Thus a very small experiment, started here in 1899, grew steadily by ones and twos. Patients were housed in huts and shelters with a minimum of capital expenditure, and year by year more and more pressure was made to extend the accommodation. There were certain dramatic moments when interested callers left cheques for £500, or when a deputation from a county council urged on us "sell your boots but provide beds." The stage of struggle and building up is ever the most vital and interesting. I often wonder whether the results which seemed so much better then than they do now were really so, or whether it was the youth and freshness and enthusiasm of all concerned and the newness of the system that gave such impetus and caused such quick developments.

The Edinburgh Dispensary and the Sequel.

The next step came with the development of the dispensary system organised in Edinburgh by Sir Robert Philip. The voluntary model so provided was rapidly copied and paved the way for the system which became a part of the public medical service with the National Health Insurance Act of 1911. From thence onwards local authorities, acting singly or in groups, have been building up their systems of antituberculosis work. As always in British procedure, a wide range of difference has marked the development. Some authorities have themselves developed a complete equipment with orthopædic provision, advanced hospital beds, and industrial colony, open-air day and boarding schools, after-care organisations, X ray plants in dispensaries, and "all the luxuries." Others have done little but farm out a few patients to voluntary institutions and spend as little as pressure from the Ministry of Health would allow. The sanatorium, which in early days was the star of first and greatest magnitude, has gradually become but one point in a constellation and there are signs that its brightness is still on the decline. As it is, however, by far the most costly single item, its relative value is worth determining.

An institution, such as the Berks and Bucks Joint Sanatorium for example, with 180 beds, costs the public something over £20,000 a year to run—and this amount represents an almost exact mean in the average cost of similar undertakings. The public asks very few questions, so also with the medical profession; the sanatorium just exists in the established order. Annual reports find their resting-place in the waste-paper baskets of county councillors; so long as no scandal occurs a deathly dullness envelopes it. Such lack of interest is unhealthy, but that is ever the trouble with public and official institutions that do not have to fight their way into the limelight.

The Basic Idea.

The basic idea of the sanatorium was that it afforded an opportunity for the "cure of consumption," and though this optimism has been modified by time presumably it should still offer some very definite values in return for the cost of upkeep. What these values amount to are best known by the body of general practitioners in the area which it serves, but probably it rarely occurs to them to criticise or consider the question as a whole, though they may have their general impressions. They would perhaps allow that a stay at the sanatorium does "some good," is "useful for a change," "gives the relations a rest," "teaches habits of hygiene," &c. We who live and work at the sanatorium hope it fulfils these functions and perhaps a few others, but we are also increasingly imbued with certain aspects of wastefulness and misdirection in the working of the scheme. For instance, we see repeatedly patients who have left the place full of hope and fitness returning in a year or two as physical wrecks, and we ask ourselves "was it worth while?" We realise often also that the short interval of health and working life that the sanatorium gave to these people has been the means of adding other handicapped lives to their families. This factor indeed is a problem which I think we have shirked far too much. The Parisians have faced it by a system of "placing out" the children born of tuberculous parents, but infant life is even yet more precious in France than in this country.

On the economic side comes the question: Is it worth while to give *so much* for a few weeks or months and *so little* for the remaining months and years of a very protracted illness? At the sanatorium is given a thoroughly ample, even generous, diet for example, and the patient is impressed that as he has lived at the sanatorium so should he "carry on" at home. He perhaps does not return to work, so the income is diminished. Yet he feels if he drops the generous feeding to which he has become accustomed his chance of maintaining the benefit gained is endangered, so he feeds up, and the healthy children have less that the invalid may have more.

Some of the Prospects.

A gradual development of late years calls also for comment. The average length of stay at the sana torium has steadily increased; in 1914 it was 12 weeks, in 1928 it was 28 weeks for adults (43 weeks children). This fact points to a change in the scope of the sanatorium. It has largely taken the place of the poor-law infirmary in dealing with chronic cases. This has some advantages: the life is on brighter, more vigorous lines; occupations are organised, crafts are taught, there are committees and interests, there is more coming and going. But there are also disadvantages; the buildings are not planned for the feeble chronic case. The advanced chronic patient is unnecessarily uncomfortable in winter and is a real anxiety to the staff lest harm should ensue. Some provision has recently been made here for "acutes," and it has been very helpful, but an entirely separate section would be a better way. Only rarely does the early case seek institution care, but the advanced should be encouraged to take it for the sake of others, and the middle cases for personal ends. Yet the sanatorium buildings are still planned on the lines which only the vigorous can reasonably profit by. If the sanatorium is sweeping all types into its net, what is it doing for them and what advances are recorded?

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* A paper read at a meeting of the Reading Pathological Society held at the Berks and Bucks Joint Sanatorium.

The sanatorium can always offer a helpful and educational "change," it can frequently initiate or carry through a useful course of special treatment; it can sometimes serve a moral or psychological purpose by altering a patient's outlook from invalidism to a more normal view, and there are indeed definitely some cases of a turning point to health again. It therefore seems to hold its own at present despite the degree of disillusionment which has been expressed.

In 30 years no specific treatment has arrived, and we are reminded of Tennyson's words:

> "Our little systems have their day
> They have their day and cease to be."

Tuberculin has had its day—and in some quarters it has still not ceased to be; serums have come and gone; vaccines have been tried and faded; heavy metals have still their advocates; surgical procedures have been in and out of fashion. Of late years the sun has come forth like a bridegroom from his chamber and has run a race with his ultraviolet derivative. Of all these one treatment at least has really been of lasting value in its own rather limited field, and that is the successfully established artificial pneumothorax. Some 253 cases have been undertaken here since 1911, and though the results are not sensational, they have meant a good deal in various ways.

1. The treatment offers a definite line of attack which, failing anything else, has a moral value. The old Devonshire saying "do good if you can but do zummat" has much wisdom in the treatment of a long disease like tuberculosis.

2. A pneumothorax course involves a régime of rest for a longer time than patience might hold out without a definite treatment.

3. When fairly complete compression can be established it has a really remarkable value. We have, indeed, on our staff to-day ex-patients treated by this means whose living and working seemed absolutely impossible four or five years ago.

The developments of the future seem likely to lie as much in the field of surgery as of specifics, and for this reason I hope that a "surgical side" will either become the rule at all large institutions or an alliance with the surgical departments of general hospitals. There is much to be said for grouping orthopædic and pulmonary cases on one area in different blocks as well as for dealing with all grades and types and ages. Just as in mental work the trend is towards larger units, so it might well be in tuberculosis. A more vigorous life for the staff is possible, and the larger the numbers the more efficiently and economically can a variety of needs be catered for. Another point is that the wider the range dealt with the less should the bogy of "infection" prevail. This is still a real hardship and disadvantage, yet a tuberculosis colony, wind-swept, sun-washed, and efficiently managed is a remarkably healthy spot in which to live.

The Tuberculosis Colony.

The sanatorium idea should move with the times, but at present it shows a tendency to stasis which is undesirable. From the first the idea of the colony has cropped up in varying forms—the "Nordrach colony," the farm colony, the industrial colony, all have had good examples and have shown certain possibilities. Finance generally wrecks them after a time; they can *not* be self-supporting. But the colony may come again, by wider groupings, by bolder planning, and by the welding of official and voluntary effort.

There is one element of "the colony" idea which is capable of very useful development—viz., the inclusion of a wide variety of children. It is very surprising that so few county units contain this provision; experience here shows that there is everything to be gained. The life of the children is quite separate, but they give brightness and vigour—they can be seen at play and heard shouting, and they make the place more homely. The teaching staff they need can give valuable help to the adults, and the medical resources called for in the diagnosis of their more indefinite symptoms also help the provision for the whole place. The criticism is often made, "But are they really tuberculous?" This is a nice point and one that I personally find increasingly difficult to determine. At any rate they are the weaklings of homes where tuberculosis has taken toll of adult members and they are wisely sent as a preventive measure. They yield naturally a fine harvest in immediate results, and I believe the tuberculosis officers who watch their later development are satisfied that these results are lasting. Certainly they very rarely return in adult life as patients. Whether they should be subjected to the label of notification as cases of phthisis is to my mind an important point, but it is a lesser evil to notify them than to withhold treatment. In looking back over the years, one feels that the children have been infinitely worth while. So also has been one other factor—the employment of patients as members of the staff. This has been done from the beginning wherever possible, and we are proud of the fact that some 40 per cent. of our staff are ex-patients. The advantage has not been all on their side—their presence is an encouragement to the patients, they bridge the gap that separates the worker from the invalid, and, further, they bring to the work conviction and enthusiasm engendered by their own success. If the fully fledged tuberculosis colony is an economic gamble too risky for public bodies to embark upon, the employment of ex-patients can at any rate be encouraged. Any technical difficulties they present as to insurance problems are worth overcoming. The mingling of normal and pathological workers calls for thought and care, but can be accomplished without harm resulting. On the economic side, if an institution can show about 40 per cent. of ex-patients on its staff and still keep a middle place on the cost list of comparative institutions, there cannot be much wrong.

I have perhaps said little on the strictly medical side, and my apology for this would be that in the long struggle with a disease like tuberculosis the medical side is less than the human, as the darkness of disease is less than the dawn of health.

KING EDWARD VII. HOSPITAL, WINDSOR.—Rapid progress with the rebuilding and extension of this hospital was reported at the annual meeting recently. The south wing will contain three wards in place of the former two; one of them is already occupied, and the other two will be available during the present month. Sir Edward Stern is adding an additional wing to the north ward, and the Lady (Gomer) Berry Hostel, which will be completed shortly, will contain nearly 100 rooms, about 80 of which will be occupied by the nurses. When this hospital is completed there will be 180 beds.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Corporal Punishment.

THE question of corporal punishment having been raised before the Edinburgh Education Authority, a motion was made that, whenever corporal punishment was resorted to, appropriate particulars should immediately thereafter be recorded in an official record kept for the purpose. A committee on day schools and attendance considered this motion and disapproved of a recommendation by a subcommittee that the clause be inserted in the regulations. After discussion at a meeting of the authority the motion was defeated. Another motion was made that the regulation, "the Education Authority are very desirous that the infliction of corporal punishment should be avoided during the time set apart for religious instruction" should have added to it "and at all times in infant departments." This was also defeated. The intention of the first motion was to bring about a gradual abolition of corporal punishment, and there is in the procedure of the Central Board of Lunacy in Scotland, now the Board of Control, strong precedent for the method suggested. For here a special register having been instituted which required an exact statement of the particular reason, the nature of any restraint enforced, the length of time of the restraint and other particulars had the effect that the strait-waistcoat ceased to be used in the asylums of Scotland. No steps were ever taken, so far as I know, to abolish any form of restraint required; the recording of the details ended in the disappearance of this particular method. And it is probable that a register of corporal punishment in schools would have a parallel history.

The Scottish schoolmasters of former days were certainly not famous for their leniency in the use of the tawse, but possibly the belief in the disciplinary efficacy of an inflicted pain is a survival of the "possession" theory of wickedness, and those that accept that theory are becoming extinct. At the Edinburgh discussion, it was admitted by one supporter that the teachers of exceptional "personality" did not need to inflict corporal punishment, which is a comment of the first value.

The Glasgow Small-pox Outbreak.

In the bulletin of the Glasgow Public Health Department it is pointed out that only one case of small-pox was recorded last month. "This case was associated with the former outbreak in respect that the patient was a painter on the ship on which the infection occurred. He worked on board that vessel from April 20th to 23rd and was diagnosed on May 11th. He had been at work on another vessel from the date of his sickening on May 5th. All possible contacts were kept under observation and no further cases of the disease have arisen. It would now appear that the outbreak is definitely at an end." It is a matter of interest that no deaths have occurred among the cases which have arisen in Glasgow, but four small-pox patients remain under treatment. The case of the ship's painter forms an illustration of the variation in infectivity. The late Dr. John C. MacVail, whose knowledge of small-pox was extraordinarily extensive, used to tell with great humour the story of the Kilmarnock registrar who divided the population into two classes—those that had had small-pox and those still to take it! The story marks the difference between the administrative resources of those days and of these. Glasgow Public Health Department is to be congratulated on the rapid arrest of a rather serious outbreak.

Dundee Royal Infirmary.

At the annual meeting the chairman stated that, while over £80,000 had been added to the Endowment Fund, the income alone being used for administration, there had been a surplus in the reserve fund only in one year. This is the fund available for the general purposes of the institution. From that fund, which stood at £109,765 in 1918 and towards which £103,305 had been received during the intervening years, it had been necessary to draw a total sum of £161,663 to meet annual deficits, leaving the fund at Dec. 31st last at £51,407. This, he said, was face value, not actual value, and in view of the large additional commitments of the infirmary, it was clear that a large addition was required not to the annual income alone but to the total funds required for extraordinary expenditure. The infirmary is one of the finest general hospitals in Scotland and within the last few years many enlargements and improvements have taken place in it. In fact Dundee as a whole is peculiarly favoured in the number of public institutions supported by generous men of wealth, and the infirmary, from time to time, has shown great public spirit in taking on fresh burdens.

Presentation of Portrait to Sir Alfred and Lady Ewing.

On his retiring from the Principalship of Edinburgh University, a portrait of Sir Alfred Ewing was presented to the University and accepted by the Lord Rector, Sir John Gilmour, late Secretary of State for Scotland. A second portrait of Sir Alfred was presented to Lady Ewing. The Chancellor of the University, the Earl of Balfour, could not be present; but there was a large gathering representative of every phase of University work and interest in Edinburgh. The artist is Mr. Lintott, R.S.A.

Child Neglect.

The Scottish Society for the Prevention of Cruelty to Children does admirable work and it is no reproach to the "Children's Charter" that prosecutions successfully instituted by it may produce a situation which appears to render all effort nugatory. Here are four cases. A labourer, aged 33, pleaded guilty to having neglected his four children between Dec. 1st and May 20th and was sentenced to three months' imprisonment; a miner, aged 48, pleaded guilty to neglecting his three children and was sentenced to three months' imprisonment, admitting one previous conviction; a pit-head worker, aged 38, pleaded guilty to neglecting his six children between March 28th and June 3rd, admitting two previous convictions, and was sentenced to four months' imprisonment; another miner, age not stated, pleaded guilty to a charge of neglecting his wife and six children, and was sentenced to three months' imprisonment. Evidence of extreme laziness on the part of the fathers was forthcoming, and it is known that prosecutions are only instituted in the worst examples. In these cases the family, during the imprisonment of the father, has to be provided for by the poor-law authorities or by the Society, and the break-up of the family and the boarding out of the children may either or both be necessary. When the father comes out of prison, he resumes, whether he wishes or no, responsibility for his wife and children, and though kind efforts may be made to give him a fresh start he frequently returns with no work or wages to his family and the same results of laziness and incapacity follow. Many years ago, the Local Government Board for Scotland, then the central authority for poor-law, had to stop the inspectors of poor, acting under the Parish Council, from bringing the children to the prison door and handing them over to the father immediately on his release. This was then the conception of reinstating "parental responsibility." Possibly this variety of poor-law activity occurs from time to time still and no doubt, in the long course of handling worthless persons, the inspectors of poor have been driven to it as the sole method of "catching" the father and preventing his final desertion. But no one can regard this as a practical procedure. But in the four cases recorded above, it is difficult to know where to begin with a remedy, and with that difficulty the Scottish Society for the Prevention of Cruelty to Children is faced continually.

It is no wonder that the Society feels that the whole problem of the preservation of children should be be studied afresh, for police methods can deal only with the superficial aspects.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

The German Surgical Congress.

THE first official subject of discussion at the German Surgical Congress, which has lately been held in Berlin, was the treatment of empyema. Prof. Sauerbruch (Berlin) said that experience in the influenza epidemic of 1918 and 1919 had modified our views on the advisability of rib-resection for this condition, the mortality after resection having been 90 per cent. For post-traumatic empyema he thinks that a wide opening with removal of part of the ribs still gives the best results, but for para-pneumonic empyema and in empyema after influenza this method has nowadays fallen into disuse, and puncture of the pleura is performed instead. Its object is to improve the general condition of the patient, and this is often effected by a single puncture though several may be necessary. Should exudation continue, Bülau's drainage is recommended; and if, in spite of this, resection becomes necessary, the operation is less dangerous after the improvement of the patient's general condition. Prof. Sauerbruch holds that rib-resection must be done in a pressure chamber. Of 63 patients operated on under these conditions, 57 healed without a fistula and six died, whereas of 32 patients operated on without a pressure chamber 17 died. Where the lung is adherent to the parietal pleura an extrapleural resection of the ribs must first be performed; two or three weeks afterwards the pleura may be opened and the adhesion reduced.

The second official subject was the treatment of ureteric calculi. Prof. Voelcker (Halle) spoke of the difficulty of distinguishing the symptoms of calculus, cholecystitis, appendicitis, and ileus, to which end radiography is not always reliable. By catheterisation of the ureter the calculus may sometimes be brought back to the pelvis of the kidney. To reduce the pain caused by a calculus spinal anæsthesia may be tried; if there is no improvement ureterotomy with primary suture is necessary. Should the colic and retention of urine improve without removal of the calculi a condition resembling chronic cholecystitis is set up and there is a danger of the kidney being damaged by infection. Treatment then consists of the administration of suitable mineral waters by the mouth, with injection of oil or glycerine into the ureter. Prof. Voelcker did not approve of dilatation of the ureter according to Burger's method or of permanent catheterisation, which increases the chance of infection. Some calculi, he pointed out, are primarily infected—especially phosphatic calculi with a rough surface. In such cases intravesical therapy is undesirable; ureterotomy is indicated and the kidney may have to be removed. In acute anuria where catherisation of the ureter has not succeeded the kidney must be made accessible. If its condition is still pretty fair a renal fistula may be made through which the calculus will usually be discharged. If stones are present in both kidneys, and neither radiography nor ureteral catheterisation shows which is most affected, both must be made accessible so that the worse can be removed.

The third official subject, the treatment of adhesions in the abdominal cavity, was opened by Prof. Clairmont (Zurich) who showed a large collection of anatomical specimens illustrating different kinds of adhesions.

A Serological Blood Test.

Prof. Zangemeister (Königsberg) not long ago reported to the Berlin Medical Society on his experiments on blood-serum. It is known that by mixing the serum of two persons, the albumin being precipitated, the mixture becomes opaque. The degree of opacity, however, is sometimes so slight that it cannot be ascertained in the ordinary way. Zangemeister has therefore used the Tyndall effect, with Zeiss's photometer, which allows a very accurate measurement of the intensity of light. A mixture of the sera of two unrelated persons and a mixture of the sera of a mother and her child are at first equally transparent. But whilst the transparency of a mixture of the serum of the two unrelated persons persists, that of mother and child by and by decreases. A second test is made by the ultramicroscope, with which the illuminated albuminous substances look like stars in the heavens. In the mixed serum of mother and child the stars gradually conglomerate into large spots. The test proved reliable in the cases tested by Zangemeister, not only for mother and child but also for father and child, and not only for new-born infants but also for persons up to the age of 30.

Nationalisation of the Profession.

Between the municipal authorities and the medical profession in Berlin a conflict has arisen, which is of fundamental importance apart from its local interest. According to the Act concerning the campaign against venereal diseases the municipal authorities are obliged to take measures for the care of persons suffering from, or suspected of suffering from, such diseases. This provision has been complied with in many cities by the establishment of municipal dispensaries. Throughout Germany these dispensaries abstained from treatment, the patient being sent with a note to his club doctor or private practitioner after he has been examined. In Berlin alone have the dispensaries from the first undertaken treatment as well as diagnosis. By an agreement made in 1928 it was stipulated that the existing dispensaries might continue on condition that no new dispensaries were established by the city, but the Berlin municipal authorities have now given notice that they do not propose to be bound any longer by this agreement, which expires on July 1st, and that they feel obliged to open new dispensaries. Negotiations between the Hartmann-Bund and the city having failed, the Hartmann-Bund has declared a boycott of these dispensaries so that no medical man belonging to the Bund may apply for or accept an appointment in them. The boycott has been extended to other dispensaries too—for instance, those for tuberculous patients, and for mothers. The Hartmann-Bund states that already no more than 10 per cent. of the patients calling at municipal dispensaries are sent to private practitioners, the remainder being cared for in the dispensaries. Obviously the Berlin municipal council, which is under the influence of the Socialist Party, aims at complete socialisation of the medical profession, as has been observed on other occasions. The Berlin profession will fight against this tendency, for it is calculated to destroy the small residue of private practice which still remains.

According to a report by the Berlin Municipal Health Office, 67 per cent. of the children examined by the municipal dentists needed dental treatment. Children with healthy teeth are rare in Berlin schools, the cause being inadequate feeding.

The Cleveland disaster has caused some anxiety as to the possibility of a similar happening in one of the German hospitals. The Government has stated in the press that long before the Cleveland disaster instructions were given to the hospitals about the storage of films and their separation from combustible material. According to this statement it is highly improbable such a thing could happen in this country.

STOKE NEWINGTON HOME HOSPITAL FOR WOMEN.—Recently Princess Helena Victoria, the Patron, unveiled a tablet to the memory of Miss Isabella Lister, who was long closely connected with this hospital, which, with the exception of the visiting doctor, is entirely staffed by women. The institution was founded in the present building in 1825 by an aunt of the late Lord Lister, whose grandfather resided at Stoke Newington; Miss Isabella Lister was another relation. The Princess named the ward containing the tablet the "Isabella Lister Ward."

MEDICINE AND THE LAW.

A Coroner on Vaccination.

AT the adjourned inquiry on June 13th into the death of a woman of 31 following vaccination (the case is reported on p. 1302 of this issue) the coroner, Mr. Ingleby Oddie, in summing up remarked that this death, as well as another into which he had just inquired, was due to post-vaccinal encephalitis after primary vaccination performed later than in infancy. People, he said, apparently acquired the unknown germ of encephalitis after infancy; in many cases it was lying dormant and was excited into activity by some such stimulus as vaccination. Since in infancy there was presumably no germ of encephalitis yet present in the child's body, it would be better for all children to be vaccinated in early infancy instead of waiting until a small-pox scare caused them to be vaccinated later in life. In that way they would evade this risk of post-vaccinal encephalitis. Further, inasmuch as secondary and tertiary vaccination did not apparently result in encephalitis, it was worth considering whether that was possibly due to the slight local and general reaction occurring in those cases. If so, might it not be wise, he suggested, to try vaccination in all cases with fewer insertions and therefore less reaction? Possibly a less active—i.e., more dilute lymph—might not give rise to post-vaccinal encephalitis in primary vaccinations. Mr. Oddie expressed regret that coroners were not supplied with important documents such as the Rolleston report, of which, it seems, he had never heard. This particular report contained recommendations which might save many lives. Such highly important records of current research work should, he said, be furnished to the officials who are always dealing with deaths. On account of their expensive nature coroners did not see, for example, the annual reports of the Medical Research Council.

Operation at Wembley Hospital: Successful Claim for Fees.

There may be a popular impression that treatment in any kind of hospital means free treatment. Another county court decision in connexion with the Wembley Hospital, has, however, illustrated the practitioner's right to charge a fee for professional services in a case where the ordinary elements of a contract can be inferred. It is a common legal principle that the acceptance of a performance which has been requested will generally support the inference of a promise to pay a reasonable reward. As the Watford county court judge pertinently asked in the case to be discussed below, "Why should a doctor be presumed to do everything gratuitously?" In such a case as the following the important evidence is that which proves or disproves the employment of the practitioner by the person against whom the claim for fees is made.

Dr. J. A. Mackinnon, of Park-drive, Wembley, claimed 30 guineas from Mr. Henry King, of Berkhampstead-avenue, Wembley, for professional services. Plaintiff, who is on the honorary staff of the Wembley Hospital, attended defendant's wife in July, 1928, having been called into consultation by Dr. Cowardin. He decided that an operation was necessary, but, as the patient suffered from a definite heart disease, the operation was postponed and medical treatment was relied upon. In August, in Dr. Cowardin's absence on holiday, Dr. Mackinnon again attended Mrs. King; in September he saw her again and came to the conclusion that immediate operation was necessary to save her life. Her husband was not then at home. Dr. Mackinnon explained to her son that he would not take the responsibility of postponement for a single day. The son was asked to get into touch with his father; he did so by telephone, returning with a message that it was all right and that the operation should proceed. It was decided to remove Mrs. King to a private ward at the Wembley Hospital and no objection was taken to that plan. Dr. Mackinnon stated that he saw the defendant at the hospital that evening and made it clear that operation was the only means of saving Mrs. King's life; Mr. King replied "I am glad you have decided to do it." The operation was entirely successful and the patient was placed in the public ward, the private ward being full. Dr. Mackinnon had further conversation with Mr. King that night. Next day he attended Mrs. King, who had collapsed in the ward, and he obtained another nurse for her. The following day there was a vacancy in the private ward (in which, it is understood, there are four adult beds) but the patient preferred to remain where she was. In answer to the judge, Dr. Mackinnon estimated that he had attended Mrs. King at least twice a day for the 12 days she was in the hospital. In cross-examination he agreed that doctors in attendance who were members of the honorary medical staff should not charge a fee; but he did not agree with that rule as regards patients who could afford to pay. He was not asked by the hospital authorities to perform the operation. Dr. Cowardin gave confirmatory evidence for the plaintiff, and another witness remembered hearing Mr. King (in discussing expense) say that he was prepared to pay in moderation. The defendant said he earned £400 a year. He received his son's telephone message and had no alternative but to agree; he was not aware that the doctors were at that moment in his house. He had agreed with the hospital authorities to pay three guineas a week for his wife; he was told he would not have to pay anything for the operation. After hearing other witnesses for the defence, including the secretary of the hospital, the judge gave judgment for Dr. Mackinnon with costs, adding that he had not heard an action with a defence of less merit. He found that there was, in fact, a contract of employment for the performance of this particular operation and that the charge was fair and reasonable. It was a very serious operation which was completely successful; moreover the plaintiff's services continued afterwards. There was nothing to suggest that the defendant should not pay the plaintiff's fee. A number of side-issues had been introduced by the defence; whatever bearing they might have on the hospital authorities of the organisation of the medical profession, they had—said the judge—no bearing on the action before the court.

One of these side-issues was a desperate attempt to discredit Dr. Mackinnon by an accusation of dichotomy. He had stated in cross-examination that Dr. Jenkins was the anæsthetist and that Dr. Cowardin also assisted at the operation; they would receive three guineas each. The objectionable element in fee-splitting is, of course, the danger that fees are unnecessarily inflated by transactions between practitioners of which the patient is kept in ignorance. In Mr. King's case the judge (after hearing evidence at what he evidently regarded as excessive length) was satisfied with the fairness of the plaintiff's charges. To know which patients can afford to pay a fee, and to know what fee they can afford, may be a difficulty, but it is a difficulty which hospitals will have to face increasingly in future. Hospitals presumably do not desire to antagonise the medical profession, nor would they feel justified in asking the public to subscribe for the treatment of those who do not need charity. In the case under discussion two witnesses who sought to establish the defendant's case were the secretary of the hospital and the chairman of its house and finance committee; the solicitors for the defendant, it is believed, are also the solicitors for the hospital. If so, there is nothing improper or sinister in the alliance—least of all if it means that the hospital will make itself responsible for Dr. Mackinnon's costs. But the recurrence of these incidents at Wembley raises a suspicion of unfriendliness towards the medical profession which tact is needed to avoid.

Workmen's Compensation: Suicide following Nystagmus.

A miner contracted nystagmus in 1926. Three years later, after visiting a doctor (accompanied by the branch secretary of the Miner's Federation) and after being told that he was still suffering from nystagmus, he disappeared and his body was recovered from a canal two miles away from his home. A claim was put forward by the widow in the St. Helen's County Court on June 12th. Evidence was given that, before he lost his health, the deceased was cheerful in temperament, but that, after contracting the disease, he grew morose and depressed. Some doubt was raised on behalf of the employers as to whether the deceased was actually suffering from nystagmus when he committed suicide. The Medical Referee held that the disease had turned his brain and caused him to take his own life. Suicide being thus regarded as a consequence of the nystagmus, the widow was awarded £400 compensation.

Merchandise Marks Act Prosecution: Coffee and Caffeine.

The magistrate at Bow-street on June 12th dismissed a summons against Wallace Pure Foods, Ltd., for having applied to certain tins of coffee, with intent to defraud, a false trade description. The tins were labelled "P. R." coffee, the initials standing for "Physical Regeneration." Labels stated that the coffee was "practically caffeine free, 100 ounces (representing 100 pints of liquid coffee) containing one-hundredth part of an ounce of caffeine." The prosecution's analysis indicated that caffeine from 3·37 to 3·7 grains per ounce was present, which was only a fraction less than the average amount contained in ordinary commercial coffee. For the defendants an analyst said that free caffeine might have been found in the coffee by analysis; but the analyst would have to obtain it from caffeine chlorogenate, a substance containing properties entirely different from those of ordinary caffeine salts. The magistrate accepted the defendant's contention that "caffeine" must mean "free caffeine" and not caffeine in conjunction with other substances. Experts for the prosecution had shown that, in order to obtain free caffeine, they had to break down the compound. This, said the magistrate, was a pale roasted caffeine (according to the label), and there was always more caffeine in dark roasted caffeine. On the dismissal of the summons an application for costs was refused. The prosecution mentioned the possibility of taking the matter to the High Court.

Tincture of Iodine.

An article which appeared in THE LANCET of Sept. 1st, 1928 (p. 443), was the subject of discussion before the Ealing magistrates on Thursday of last week, when Messrs. F. W. Woolworth and Co., Ltd., were fined £2 under the Food and Drugs (Adulteration) Act, and ordered to pay 10 guineas as costs for selling to an inspector of the Middlesex County Council "tincture of iodine" not compounded in accordance with the British Pharmacopœia, but consisting of a weak solution of iodine in isopropyl alcohol. For the defence it was stated that Messrs. Woolworths formerly sold tr. iodi mit., B.P., but last August were warned by the Excise authorities that the sale must be discontinued unless they had a spirit licence. The article by Dr. R. A. Macdonald and Mr. J. W. Peck, of the Great Ormond-street Children's Hospital, which appeared in THE LANCET soon afterwards, recommended a solution of iodine, 1·25 per cent., in isopropyl alcohol as an economical and satisfactory substitute for hospital use for skin antisepsis. This could be sold without a licence, and Messrs. Woolworths had been selling it labelled "iodine solution" since February. Among the witnesses for the defence was Dr. P. W. Boobbyer, of Ealing, who said that the solution was an excellently effective preparation which he would use himself without hesitation. Anyone other than a doctor who used iodine generally used 500 times as much as was required. The magistrates intimated that they thought that in selling the substitute when tincture of iodine was asked for, Messrs. Woolworths had been negligent, but not deliberately fraudulent.

Public Health Services.

REDUCTION OF TUBERCULOSIS IN LANCASHIRE.

THE Tuberculosis Committee of the Lancashire County Council has just presented a report showing the decrease in the number of deaths recorded from both pulmonary and non-pulmonary tuberculosis during 1928, as compared with previous years. The death-rate from *pulmonary* tuberculosis—namely, 0·58 per 1000 of the population—is the lowest on record in the administrative county for the sixth year in succession. For *non-pulmonary* tuberculosis the death-rate—namely, 0·15 per 1000—is also the lowest recorded for the county. Under the Public Health (Tuberculosis) Regulations, 1912, the total number of notifications of new cases of tuberculosis for the year 1928 in the administrative county is the lowest on record, as will be seen from the following table:—

Tuberculosis Notifications.

Year.	Pulm. tuberc.	Non-pulm. tuberc.	Total	Notifications.*	Year.	Pulm. tuberc.	Non-pulm. tuberc.	Total	Notifications.*
1913..	2700	1592	4292	1·54	1921..	2044	899	2943	1·16
1914..	2820	1140	3960	1·61	1922..	1863	956	2819	1·05
1915..	2872	1128	4000	1·64	1923..	1937	1188	3125	1·09
1916..	2689	1180	3869	1·52	1924..	1972	1120	3092	1·10
1917..	2375	1062	3437	1·35	1925..	1846	1027	2873	1·03
1918..	2534	885	3419	1·47	1926..	1828	953	2781	1·02
1919..	2105	847	2952	1·21	1927..	1794	1045	2839	0·99
1920..	2084	968	3052	1·20	*1928..*	*1660*	*956*	*2616*	*0·91*

* Number of notifications of pulmonary tuberculosis per 1000 of population.

The improvement, it is pointed out, is really greater than the figures show, as in the earlier years there is no doubt that a considerable number of cases escaped notification. This is proved by the fact that in 1918 there were 303 deaths from pulmonary tuberculosis in which the case had not been notified, whereas during 1928, with general greater efficiency in rendering notifications under the regulations, the figure dropped to 56.

The decline in the number of deaths recorded, and of new cases of tuberculosis notified in 1928, has taken place despite the serious amount of unemployment in the staple industries.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 8TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 272 (last week 242); scarlet fever, 1614; diphtheria, 929; enteric fever, 41; pneumonia, 1014; puerperal fever, 36; puerperal pyrexia, 110; cerebro-spinal fever, 14; acute poliomyelitis, 2; encephalitis lethargica, 22; dysentery, 6; ophthalmia neonatorum, 112. No case of cholera, plague, or typhus fever was notified during the week.

The largest incidence of small-pox at the moment is in London (Bethnal Green, 15; Shoreditch, 11; Stepney, 30); Blackwell R.D. (Derby), 15; South Shields, 11; West Ham, 28; Northampton, 16; Stoke-on-Trent, 24; Spenbury (Yorks), 6; Pontefract R.D., 8.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on June 11th–12th was as follows:—Small-pox, 301 under treatment, 14 under observation (last week 286 and 16 respectively); scarlet fever, 1348; diphtheria, 1525; enteric fever, 16; measles, 164; whooping-cough, 583; puerperal fever, 30 (plus 10 babies); encephalitis lethargica, 119; "other diseases," 51. At St. Margaret's Hospital there were 18 babies (plus 10 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 4 (1) from enteric fever, 63 (3) from measles, 4 (1) from scarlet fever, 32 (6) from whooping-cough, 21 (6) from diphtheria, 48 (5) from diarrhœa and enteritis under two years, and 53 (6) from influenza. The figures in parentheses are those for London itself.

Liverpool reported 20 deaths from measles, Leeds 6, and Birmingham 5. Leeds stood highest with 3 deaths from whooping-cough. Diarrhœa accounted for 5 deaths in Liverpool, 4 in Nottingham, and 3 each in Birmingham, Leeds, and Sunderland. Birmingham reported 4 deaths from influenza.

The number of stillbirths reported during the week was 264 (corresponding to a rate of 35 per 1000 births), including 53 in London.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1928 statistics of two sea-port cities and a county:—

Name of district and estimated (R.-G.) population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Plymouth .. (211,980)	17·0	12·0	0·90	1·52	2·1	1·3	69/34	38	6·0
Aberdeen (City).. (159,954)	20·7	14·0	1·05	1·55	1·8	—	94/38	43	7·5
Aberdeen (County).. (105,713)	21·9*	13·4	0·97†	1·29	1·6	—	63/—*	—	4·2*‡

* Amongst a population of 120,801, including 8 of the 10 burghs.

† Amongst a population of 143,191, including the 10 burghs.

‡ From puerperal sepsis only.

Plymouth.

Dr. A. T. Nankivell mentioned last year that extension of maternity and child welfare work would be not only desirable but also popular with the citizens. This increase has not yet been accomplished, but Dr. Nankivell hopes that before long it will be forthcoming. Some of the practitioners in Plymouth view with apprehension this extension and that of the school medical service, and Dr. Nankivell goes on to point out how very much better from a financial point of view it is for the panel doctors to have charge of patients whose health has been well supervised in their youth. An increase in the medical staff is needed not only for extensions but for meeting sickness absence, holidays, and emergencies. There were 28 cases of mild small-pox with no deaths, and Dr. Nankivell welcomes the provision of the new hospital at Lee Mill which is now nearing completion. Among other matters which indicate the progress in 1928 are: The completion of the central laundries for the corporation hospitals; the opening of a new block for boys at Didworthy sanatorium; the installation of an X ray plant at Beaumont House tuberculosis dispensary; the provision of a new motor-ambulance, and the sanction of the Ministry for the treatment of 40 cases of intermediate and advanced tuberculosis in women at Swilly Hospital.

Health education has received much attention. 132,000 copies of the magazine "Better Health" were distributed. As an example of the usefulness of the latter, a case is quoted where a woman consulted her doctor early as the result of listening to an article read by her son on cancer. The articles in "Better Health" are used for essays and lectures in the schools. The municipality own a number of cinematograph films, which were exhibited thousands of times at the theatres and cinemas. The "Runsyne" machine with its illuminated messages on health subjects has been operating in two positions during the year. Much educational work was carried out at the Health Exhibition in the Drill Hall during a week in July. Dr. Nankivell mentions that there have never been so few deaths from tuberculosis as in 1928, but that there is a marked increase in cancer mortality. He thinks the slow disappearance of tuberculosis is chiefly due to the facts that the disease is naturally dying out, that the standard of living is getting better, that the people are becoming more educated, and that the activity of tuberculosis schemes is increasing. Plymouth has much house property of so poor and decadent a nature that it is not reasonably fit for human habitation. The reconditioning work done during 1928 is described but, says Dr. Nankivell, only the fringe of the housing problem is touched as yet, and the fact that we are now suffering from the want of foresight of our great grandfathers is no excuse for inertia to-day. Dr. Nankivell looks forward to a great improvement in the hospital facilities of Plymouth when the poor-law is taken over next year.

The yield of oysters from the Tamar beds shows a reduction in recent years, and there is reason to believe that the beds have been overdredged and should be given a rest for several years. The oysters obtained, owing to the pollution of the Tamar, are replanted in the Yealm and Helford rivers until ready for sale. The purity of the Yealm is being threatened by crude sewage from the new houses springing up on its banks. The attempt to breed oysters in the Yealm has up to now been a failure.

The municipal slaughter-house ("an unseemly and inadequate place") is to be closed, and a new modern abattoir with proper cold storage in the neighbourhood of Prince Rock is strongly urged. This question has been discussed without result for a quarter of a century.

Aberdeen.

The acting medical officer of health, Dr. George S. Banks, states that the present report is mainly a statistical survey, the results of various experimental investigations of the health department having been incorporated in the 1927 report. The figures for 1928 bring out the greater relative fatality of measles and whooping-cough. Thus there were 728 notifications of scarlet fever with 5 deaths, a case-fatality of 0·7 per cent.; there were 458 notifications of diphtheria with 15 deaths, a case fatality of 3·3 per cent.; the cases of measles known to the health department numbered 1812 with 50 deaths, a case-mortality of 2·8 per cent.; while the cases of whooping-cough reported numbered 579 with 37 deaths, a case-mortality of 6·4 per cent. Out of 15 notified cases of paratyphoid B, 6 occurred in an institution as the result of infection by a carrier. The immunisation scheme makes progress and during the year 1704 children were immunised at the welfare centres and 2646 in the schools simultaneously against diphtheria and scarlet fever, while 665 out-patients were similarly dealt with. The case-notes are given of an unusual attack of continued fever caused by *B. alkalescens* (Andrewes). The illness ended in recovery after about six weeks in hospital. It is estimated that of the 168 deaths from tubercle, 92 per cent. were due to the human bacillus and 8 per cent. to the bovine. Of 90 samples of milk examined, 6, or 6·7 per cent., contained tubercle bacilli, while the average percentage for the years 1923–27 was 5·7.

In January an outbreak of septicæmia occurred in a maternity institution which had provision for 26 maternity beds and 8 antenatal cases. The wards were considered to be overcrowded and relief was given by the admission of patients to the municipal hospitals. Twelve mothers developed puerperal fever within a period of 5 weeks and 4 died. The outbreak was due to hæmolytic streptococcal infection. Concomitantly there was an outbreak of icterus neonatorum with 7 infant deaths, and the *S. hæmolyticus* was found post mortem. Examination of the "contact" mothers revealed the *S. hæmolyticus* in the uterus and throat of one, in the uterus of 4 others, and in the throat of 3 others. Out of 12 nurses, 5 gave positive results from throat cultures. Some of the findings of the report of the Scottish Board of Health on maternal mortality in Aberdeen 1918–27, published in 1928, are given. It is suggested, amongst other things, that the high incidence of puerperal sepsis in maternity institutions in Aberdeen is due to contagion, and that the higher incidence of puerperal sepsis in the practice of doctors as contrasted with that of midwives is due, partly, to a streptococcal carrier condition in doctors. Of 3423 live births, 652 were attended by midwives; 603 as in-patients and 194 as extern patients by the maternity hospital; 1972 by medical practitioners, and 2 were unattended. There were 25 deaths of women associated with pregnancy and childbirth, including all deaths within four weeks after childbirth or later if the illness originated in the puerperium. In 4 the confinement was attended by a midwife; in 9 by the maternity hospital; in 7 by medical practitioners; and in the remaining 5 by other institutions. In 12 of the cases the fatal confinement was the first.

The undertaking with the parish authorities to admit all the sick poor to Woodend Hospital was occasionally difficult to fulfil, but no pneumonias were refused admission to hospital. There were 110 lobar pneumonias treated in hospitals with 7 deaths, 76 broncho-pneumonias with 12 deaths, and 7 influenzal with no deaths. One butcher, who sold a carcass of a pig grossly affected with tuberculosis to another, was fined £20 and the recipient of the pig £5. The sunshine record was 1227 hours, as compared with an average of 1285 for the previous 30 years.

A table giving a comparison of the statistics of the six principal Scottish towns shows that the standardised death-rates from all causes were: Edinburgh, 13·9; Aberdeen, 14·1; Paisley, 14·4; Dundee, 15·1; Glasgow, 16·7; and Greenock, 17·1; and that the infant mortality-rates were Edinburgh, 75; Aberdeen, 94; Dundee, 102; Paisley, 105; Glasgow, 107; and Greenock, 120.

Aberdeen County.

Dr. Harry Rae (who has since been appointed M.O.H. for the city of Aberdeen) reports that the immunisation scheme against diphtheria and scarlet fever is being continued, but that this work in a rural area must be more or less sporadic unless a special medical staff is employed. In addition to the schools immunisation has been used for the employees of three dairy farms which supplied Certified Milk. Retesting is found to be very necessary, but during the year there were only three notifications of diphtheria among children who had been inoculated. In order to obtain a higher immunity against scarlet fever four injections are being used instead of three, the fourth being one of 5000 skin test doses. It has been found that immunity against scarlet fever is usually established 14 days after the last injection. This scarlet fever immunisation may prevent the occurrence of "return" cases, whilst the same cannot be said of diphtheria, in the case of which immunity takes from six weeks to six months to develop. In order to prevent "return" cases of diphtheria, passive immunisation by 2000 units of antitoxin is recommended. The dosage laid down for the treatment of diphtheria is 4000 units for the first day of illness, 6000 units for the second day, and 8000 for the third day.

A county institution had one fatal case of typhoid fever in April and contemporaneously, an outbreak of ten cases of paratyphoid B, which appeared to be associated with a carrier in the kitchen staff. At the end of August there was a sudden outbreak of infantile paralysis chiefly in the neighbourhood of Fyvie. There were 13 cases in all, with one death. Three of the cases occurred in areas distant from Fyvie. Of the ten Fyvie cases three occurred in one family and two in another. Social circumstances and milk-supply had no bearing on the outbreak. The diagnosis was confirmed by the examination of the cerebro-spinal fluid. One of the two cases in one family had a previous attack six years ago, on which occasion paralysis of the leg appeared five weeks after the initial illness. After the second attack there was paresis of the left arm. The particulars of this case were confirmed by the records of the county public health department and of the city hospital. A previous outbreak of this disease occurred in the city from April to September, 1916, when there were 79 cases and 4 deaths, and coincidently 16 cases in the county with no deaths. In the 1916 outbreaks there appeared to be no connexion between the cases except in two households where there was a second case, and the households affected were chiefly of good social status.

The housing position shows progress in the provision of new houses. Dr. Rae is enthusiastic as to the advantages of the Housing (Rural Workers) Act, 1926, and thinks it is the only Act which will stem the tide of rural depopulation. Under this Act there were only 50 applications in 1927, whereas in 1928 there were 126, 43 of which were dealt with by the Deer District Committee. Dr. Rae goes on to point out that the Act is not limited to the housing of agricultural workers, but applies to those with similar financial resources, and is also applicable to burghs. He urges every burgh to adopt the Act, and further emphasises the powers given by many housing Acts to local authorities to purchase and reconstruct dilapidated properties, which can then be let at rentals within the reach of the poor. In many of the burghs owners of houses are financially unable to put them in habitable repair according to present-day standards.

The county veterinary inspector points out that with the present staff it is only possible to visit the dairy farms in the widespread area of the county once a year, and that a more frequent inspection is necessary for the detection of tuberculosis. In Aberdeenshire many of the cows are bought newly calved and only retained in the herd for one lactation. It follows, therefore, that many cows enter and leave a herd during the course of a year without ever having been seen by the veterinary inspector. During 1928 the inspector discovered 21 cows with tuberculous mastitis, which were dealt with under the Order. In three notified cases of (human) non-pulmonary tuberculosis the evidence appeared to incriminate certain milk-supplies, and the veterinary inspector found that two of the patients had been supplied with milk over a prolonged period from farms where there were cows suffering from tuberculous mastitis.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.—The Neech prize offered annually for the best paper read before a branch or group of this Society has been awarded for the session 1927–28 to Dr. H. Stanley Banks, medical superintendent of the City Isolation Hospital, Leicester. Dr. Banks's paper was on the Intensive Serum Treatment of Severe Diphtheria, and was read before the Fever Hospital Medical Service Group of the Society. A paper on the same subject by Dr. Banks and Dr. George McCracken appeared in THE LANCET of July 7th, 1928 (p. 4).

The annual provincial meeting of this Society will be held at the Sedbury Park Hotel, near Chepstow, on Saturday, June 29th, at 10.30 A.M., when Dr. E. Colston Williams (county medical officer for Glamorgan) and Dr. R. M. F. Picken (medical officer of health for Cardiff) will open a discussion on the Medical Aspects of the Local Government Act, 1929. After lunch members will motor to Chepstow Castle, Tintern Abbey, and Raglan Castle, and thence to a garden party at Llanover Park, by invitation of Lord Treowen, Lord-Lieutenant of Monmouthshire, and Lady Treowen. The full programme may be found in the current issue of *Public Health.*

Corrigendum.—We regret an error which occurred in the obituary notice last week of Sir William Fairbank. Mr. H. A. T. Fairbank is the son of the late Dr. Thomas Fairbank, the elder brother of Sir William.

Obituary.

SIR WILLIAM THOMPSON, M.D. DUB.,

FORMERLY REGISTRAR-GENERAL FOR IRELAND.

THE sudden death of Sir William Thompson on the night of June 10th caused a sense of personal loss to the whole medical profession of Dublin, as well as to a large circle of friends. After a day of usual activity, and presenting no evidence of ill-health, he retired to bed, and was found dead next morning. He was 68 years of age.

Thompson was born in the north of Ireland, but spent his whole life from boyhood in Dublin. As a young man he entered the Civil Service, but shortly abandoned it for medicine, and qualified in 1888 with the double diploma of the Irish Royal Colleges. Six years later he proceeded to the degree of Bachelor of Medicine of Dublin University, took the M.D. degree in 1895, and became a Fellow of the Royal College of Physicians in 1902.

SIR WILLIAM THOMPSON.

Photo by Lafayette.

In his earlier professional life Thompson was engaged in general practice, but soon was elected physician to Jervis-street Hospital. He resigned medical practice in 1909 on his appointment as Registrar-General for Ireland, in which office he continued until his retirement under the age rule three years ago. During the second Vice-Royalty of Lord Aberdeen he was one of the physicians to the Lord Lieutenant, and during his tenure of this post he came prominently before the public eye. For Lady Aberdeen decided to organise a campaign for the improvement of health in Ireland, and, in particular, to fight against tuberculosis, and in this campaign Thompson was her chief adviser and right-hand worker. He showed an energy and power of organisation which had hitherto had little scope, and the success of the campaign in educating the public of Ireland, and in reducing the mortality from tuberculosis, is largely due to his energy and gifts. In work of this kind he remained indefatigable up to the day of his death.

In 1925, having filled various other offices, he was elected President of the Royal College of Physicians of Ireland, and the following year saw his retirement from public office, since when he devoted the whole of his time to voluntary philanthropic work. The Women's National Health Association, the Sanatorium for Tuberculosis at Peamount, Sir Patrick Dun's Hospital, the Royal Victoria Eye and Ear Hospital—these are only a few of the institutions where he expended his energy. He was a working member of innumerable committees, and everywhere that he worked his common sense, his business capacity, and his good humour made his help effective. He will long be missed on the executive of these and other philanthropic and humane undertakings in Dublin. For his gifts of adaptability, geniality, and good-heartedness made him the most pleasant of colleagues.

At his funeral, which was held at the Centenary Methodist Church, St. Stephen's Green, Dublin, on June 13th, all the numerous institutions and associations which he had served so well were prominently represented, among a large assembly of friends and the general public.

Correspondence.

"Audi alteram partem."

EXAMINATION OF TUBERCULOSIS CONTACTS.

To the Editor of THE LANCET.

SIR,—I have read with great pleasure your leading article of June 8th and the criticisms of it last week. If Sir Robert Philip and Dr. Fanning will pardon me I think they have taken the lighter parts of the article far too much to heart. At various periods I have had charge of a children's sanatorium and there is nothing I think sadder than the thought that probably 90 per cent. of the little patients had no tuberculosis at all and yet they had been notified and thus stigmatised for life. Every central tuberculosis dispensary ought to have a good X ray plant, but in many ways it would be dangerous as many more children would be sent to sanatoria simply on hilar shadows, if the tuberculosis officer has an idiosyncrasy in that direction. Obviously we do get pulmonary tuberculosis in school-children with tubercle bacilli in their sputum, but they are extremely rare. The omnibus expert and the pseudo-sanatorium are the two outstanding blots on all tuberculosis schemes. Abolish them and the "contact" and other questions will right themselves. There ought to be many more convalescent homes for debilitated contacts.

I am, Sir, yours faithfully,
JAMES D. MACFIE.

Winsley Sanatorium, near Bath, June 15th, 1929.

To the Editor of THE LANCET.

SIR,—It is perhaps natural that the first paragraph of your leading article of June 8th should have provoked indignant replies from those who practise and preach the doctrine of examination of contacts. Even those of us who are very sceptical about its value as a preventive measure would nevertheless hesitate to recommend that this practice should be dropped. The careful examination and following up of the families and contacts of tuberculous persons, while, in the experience of most tuberculosis officers, it fails to detect symptoms of tuberculosis which anyone with an ounce of scientific scepticism would regard as significant, is gathering for us over a long series of years just that information necessary to establish a sound knowledge of the natural history of the disease which at the present time tends to be theoretical and founded on analogy with the pathological course of the disease in animals. Here is a group of persons willing in their own interest to submit themselves to examination, some of whom are certain to present manifest signs of tuberculosis sooner or later. The opportunity of watching their progress should not lightly be thrown away.

It is a fact that the great majority of cases of pulmonary tuberculosis which come under the notice of a department for the first time are not associated by familial or other contact with any previous known case. Further, those cases which do come of tuberculous families are very frequently unrecognisable as cases of tuberculosis even of an incipient character during the period over which it is reasonably practicable to submit most of them to continuous examination and supervision. For the reason already given it is desirable to extend the period of observation indefinitely in as many cases as possible, but if the results are to be of practical value the selection of cases for such observation should not depend on the presence of some evidence that the individual so selected is already prone to develop the disease. The obstacles to such a line of study are, of course, obvious to all whose function is the detection and cure of disease.

Since ever measures specifically directed at the eradication of tuberculosis have been discussed, there has been difficulty in balancing the two arms of attack—viz., prevention of infection and stimulation of resistance to it. The pendulum has swung one way and then the other. The inevitable result of the enthusiasm of the sanatorium specialists in the first decade of this century naturally led to the inauguration of schemes for early detection of cases and their submission to open-air treatment. An essential part of such schemes was the examination of contacts, and, of course, if the signs and symptoms are sufficiently indefinite it is possible to get very good results by this means. But, as a result of the work of the very sound and able clinicians of whom the tuberculosis service is now composed, there appears to be a swing back to the importance of preventing the spread of infection by isolating the advanced and highly infectious forms of the disease. The facts presented by Dr. Lissant Cox as to the incidence of tuberculous meningitis in the *infants* of infected households are an illustration of the influences coming to bear on the problem.

Obviously, we must lose nothing which we have gained by the intensive study of sanatorium treatment since 1912, but one of its most important lessons seems to be that the boosting of resistance should be applied before symptoms of any kind have appeared, and should not merely be confined to the suspected contacts of known cases of tuberculosis. Indeed it is a question affecting the general health of the community and depends as much on the education in hygiene of the healthy as of the *suspected*, since the latter must suffer for the communal sins of the former—as witness the problems of ventilation even in the office of a medical officer of health.

I am, Sir, yours faithfully,
RALPH M. F. PICKEN,
June 17th, 1929. M.O.H. and School M.O., Cardiff.

To the Editor of THE LANCET.

SIR,—Your thoughtful and timely comments on the report of Dr. Lissant Cox and the Lancashire Group of Tuberculosis Officers include criticisms of contact examinations as carried out at dispensaries with which many, though not all, tuberculosis officers will agree. But the criticisms hardly apply to home visits and contact examination in the home. If the tuberculosis officer makes a routine visit to the home of every patient, notes the conditions of life there, writes down the names of all members of the family as well as others exposed to infection, and reviews, or inquires about, the health of each, the procedure is by no means futile ; for—

(1) He is enabled to suggest useful readjustments in the patient's mode of life and endeavour to prevent infection.

(2) He may discover delicate children and benefit them by preventorium treatment.

(3) An unsuspected source of infection is sometimes noted.

(4) Occasionally a case of active major tuberculosis is found and treatment initiated. It is true that a number of cases with a few physical signs and symptoms will be seen who do very well at home with no special treatment; but experience helps to indicate what line should be followed in such cases.

(5) He notices what is disclosed in this report—the frequency of non-pulmonary tuberculosis in the households of tuberculous patients.

Some of this work can be done by the health visitors, but their services are perhaps more useful in following up cases and assuring, as far as possible, that patients act, and continue to act, according to instructions. The best potential preventive agent is the general practitioner, but the tuberculosis officer can help him considerably, without friction and without causing the patient to lose confidence in his adviser.

I am, Sir, yours faithfully,
Paignton, June 14th, 1929. ERNEST WARD.

To the Editor of THE LANCET.

SIR,—I read with great interest the first paragraph of your leading article of June 8th, and congratulate you on your courage. We have, in the Administrative County of Lancaster during the last 14 or 15 years, found that the examination of contacts is a matter of the greatest importance. But the contacts require to be selected. Thus, in the Administrative County in the last three years we have examined 3047 contacts, of whom 253 (168 pulmonary and 85 non-pulmonary) cases were definitely diagnosed as tuberculous ; 33 per cent. of the pulmonary cases had a positive sputum. Clearly, as your writer pointed out, a large proportion of such contacts are above school age. Your paragraph concludes with the sentence : " The so-called ' tuberculous seedling ' is not the precursor of the consumptive adolescent who from diffidence or pressure of business is usually reluctant to attend the dispensary as a contact." Our experience entirely supports this view. Further, our administrative arrangements as to the proportion of beds for adults and children are based upon it. Thus, 91·6 per cent. of pulmonary beds are reserved for adults, and we save much money by having but few beds for children supposed to be suffering from tuberculosis. Out of part of this saving we are able to devote more money to provide the tuberculosis officer with up-to-date diagnostic facilities—e.g., X ray apparatus—and also to pay salaries which will attract highly skilled officers. In short, we lay the greatest stress on accurate diagnosis and isolation of adult infective cases.

I am, Sir, yours faithfully,
G. LISSANT COX,
June 17th, 1929. Central Tuberculosis Officer, Preston.

*** We print on p. 1326 an extract from Dr. Cox's report to the Lancashire County Council giving the results of the Tuberculosis Committee's scheme.—ED. L.

PAYING A PATIENT'S BILLS.

To the Editor of THE LANCET.

SIR,—As the defendant in the action, Maley *versus* Churcher, certain features of the case struck me forcibly. Never have I been so surprised at reluctance to pay an account. A young schoolmaster is found one evening lying on the floor of one of the school bathrooms with a large wad of cotton-wool soaked with ether over his face. The scholars are mostly foreigners, boys and girls, thoroughly scared at this development. At his own request, the patient is sent home by car in the charge of a nurse. Neither will the father, who has his son home safe and sound, nor will the principal, who has had the cause of the upset in her school removed, pay for the hire of the car. The only application for payment made to me was a curt solicitor's letter stating I was liable for the hire of the car, and that failing immediate payment proceedings would be started. This was the first definite information I received that the car had not been paid for.

This case illustrates once again the value of membership of one of the medical defence societies. The solicitors of the Medical Defence Union came down to Eastbourne, with counsel, to contest the case, and did their unavailing best. Two appeals have failed to reverse the decision. It would have been very simple to have paid the £5 when first demanded, but a principle appeared to be at stake. The case was well worth fighting, even if the result was defeat. I have to pay the car hire and the Medical Defence Union the costs of both sides throughout the case. As a profession we now know that no one need suppose that a doctor is acting as an agent for his patient, unless with one and every order an explicit statement of such agency is made.

It may be mentioned that the school was only a holiday one, not one of the Eastbourne resident schools, and that my account for professional attendance remains unpaid.

I am, Sir, yours faithfully,
D. G. CHURCHER, M.D., F.R.C.S.
Eastbourne, June 17th, 1929.

*** We protested vigorously last week against the continued operation of legal rules under which the decision against Dr. Churcher was possible.—ED. L.

WOMEN'S HOLIDAY FUND.

To the Editor of THE LANCET.

SIR,—At a time when discussion of holiday plans is heard in all directions, and the eye is met by posters urging one to travel abroad or to take one's holidays in June, may we be allowed to remind your readers of the many poor women in London who get little or no relief from the monotony and drudgery of their daily lives? Last year the Women's Holiday Fund sent away 1025 women and 377 children for a fortnight's holiday to the seaside. The committee hope to be able to assist at least as many this year, provided they receive the same generous support. £3 is the average cost of a fortnight's holiday, but a gift of £2 will ensure *one woman having a holiday*, as the applicants contribute about one-third of the cost. It is unnecessary to dwell on the value of a holiday to those coming from poor and in many cases sadly overcrowded homes, and particularly to the wives and mothers on whom the burden and strain of life rests most heavily. The experience is, as many of them express it, "like a bit of heaven," especially when it is the first holiday of their lives. Subscriptions, large or small, will be gratefully received and acknowledged, and should be sent to the Secretary, Women's Holiday Fund, 76, Denison House, 296, Vauxhall Bridge-road, London, S.W. 1.

We are, Sir, yours faithfully,
A. F. LONDON,
MANUEL J. BIDWELL,
J. SCOTT LIDGETT,
HELEN A. POWNALL
(Chairman of the Executive Committee of W.H.F.)
June 18th, 1929.

WANTED, A PHOTOGRAPH.

To the Editor of THE LANCET.

SIR,—I am forming a collection of photographs of the pioneers of tropical medicine in connexion with the museum of the new London School of Hygiene and Tropical Medicine. I am particularly anxious to secure a photograph of Dr. George Thin (1838–1903), who made notable contributions to our knowledge of tropical affections, especially in connexion with sprue. If any reader has such a portrait to spare, or would lend it to be copied it would be very much appreciated.

I am, Sir, yours faithfully,
H. B. NEWHAM, M.D.,
Curator, London School of Hygiene and Tropical Medicine.
37, Torrington-square, W.C., June 18th, 1929.

SURGICAL ILLUSTRATIONS.

To the Editor of THE LANCET.

SIR,—I cannot help feeling that your reviewer has somewhat missed the point in his note on "the Graphic Guide to Elementary Surgery," by Prof. Naegeli, an English translation of which has just appeared. (THE LANCET, May 25th, p. 1096.) Whatever its artistic merits or defects it is unquestionably the most complete attempt that has yet been made to enable the student to visualise the underlying principles of surgery. Every page of the volume is filled with thumb-nail sketches, and, although it is true that in many instances these are from the artistic standpoint extremely crude, yet in every instance they show precisely the point which the surgeon wishes to stress, so much so that it would be a perfectly simple matter for a student to revise his knowledge without ever reading a line of the text. The mere crudeness of the illustrations is in fact a guarantee that the attention of the student will be directed to the essential point and that it will not be distracted by "artistic" detail. Personally, from the point of view of a teacher, I regard the volume as a perfect gold mine of suggestions for the blackboard, for there is not a single drawing in it which cannot be reproduced in chalk in a few seconds.

In my appreciation of Prof. Naegeli's diagrams, I am speaking from experience, for in my own book, "The Art of Surgery," I have attempted to illustrate my meaning by thumb-nail sketches in a somewhat similar way, and the difficulty of doing so can only be appreciated by those who have attempted it. It has been a constant source of friendly rivalry between my artist and myself as to whether the picture should show what I want or be well drawn, and we have both realised the risk of losing the meaning of my own crude sketches in an effort after artistic perfection. It is quite obvious that Prof. Naegeli was "top dog" in the partnership, whilst I perhaps have given in too much, but I am by no means sure which of us is right. At any rate, there is no possible doubt in my mind as to the immense practical value of his book, both to the student and his teacher.

I am, Sir, yours faithfully,
Queen Anne-street, W., June 18th, 1929. H. S. SOUTTAR.

A DESERVING APPEAL.

To the Editor of THE LANCET.

SIR,—We are writing to appeal for funds on behalf of Dr. Charles Powell White, who, as the result of a severe cerebral hæmorrhage, is unable to maintain himself, his wife and family. This position is largely due to the fact that he has devoted his life to cancer research for the benefit of the general public and the world at large. By his writings and works he has obtained an international reputation as an authority on cancer problems.

For many years he has given all his time to cancer research in Manchester for the Christie Hospital for Cancer, the Pilkington Cancer Research Fund, the University of Manchester, and the Manchester Committee on Cancer. In each of these appointments he has received only a nominal salary for a man of his eminence, and not being on the teaching staff of a University, he is not eligible for any pension. Possessing the highest medical and surgical qualifications, he could have commanded a much more lucrative position in the active practice of his profession, but he preferred to use his wide knowledge of mathematics, chemistry, physics, and general natural sciences for the study of cancer, its treatment and prevention.

Dr. Powell White's work has a soundness of character and a breadth of application still only incompletely recognised. Thus it is to him that we owe the present classification of tumours—a classification which has been very widely adopted by pathologists. His other work is less generally known, since it is more mathematical and abstruse, but from it emerges the fact that certain analyses suggest that in persons suffering from malignant disease, changes occur which show that some fundamental metabolic disturbance is present in this condition and that these changes are greater than can be accounted for by the growth itself. He possesses a grip of the problem of malignant disease shared by few.

Dr. White has conducted long and tedious analyses on cancer problems which would have daunted many by their extent and difficulty, and it was in his laboratory that he was taken ill. He has a world-wide reputation as an authority on cancer, and has communicated an article on the subject to your columns. We hope that many of your readers to whom we cannot send the special letter of appeal will be able to contribute towards the fund.

Subscriptions should be sent to Mr. Wilson Hey, 16, St. John-street, Manchester.

We are, Sirs, yours faithfully,
WALTER H. MOBERLY,
Vice-Chancellor, The University of Manchester.
FREDERICK P. NATHAN,
Chairman, The Christie Pavilion and Home.
R. VEITCH CLARK,
Chairman, The Manchester Committee on Cancer.
June 18th, 1929.

LOCAL ANÆSTHESIA.

To the Editor of THE LANCET.

SIR,—The duration of anæsthesia after the injection of novocaine solution is a direct function of the concentration of the drug. It is immensely increased if adrenalin be added. This suffices to explain the long anæsthesia which Mr. C. Abbott-Brown obtains, for he uses a much stronger solution than is injected into the spinal canal and adds adrenalin which should not be used intradurally as the resulting prolonged anæmia has been thought to be harmful to the delicate nervous tissue of the spinal cord.

I am, Sir, yours faithfully,
CHARLES A. PANNETT.

Pensford-avenue, Kew Gardens, June 17th, 1929.

THE NATIONAL PHYSICAL LABORATORY.

ANNUAL INSPECTION BY THE GENERAL BOARD.

THE annual inspection of the National Physical Laboratory at Teddington by the General Board is a function to which invitations are accepted with enthusiasm. While the visitors make holiday the scientific staff are allowed to enjoy only that form of recreation which results from change of occupation, for the work of answering questions and explaining the exhibits is at least as strenuous as their ordinary labours. The problem for the visitors consisted in deciding which of over 200 exhibits they would inspect. Many of them were anxious to be towed along the William Froude national tank, and while waiting their turn found much to interest them in the moulding shop where model ships the size of small pleasure boats are cut to any desired shape by most ingenious mechanical devices. The material of which these models are made is hard wax (not, as one visitor guessed, soap) to which any desired superstructure can easily be attached.

Wind Resistance to Ships.

The tank, which is enclosed in a building, is 500 feet long, 30 feet broad, and 12 feet deep. It is used chiefly to measure the air resistance to a ship in motion by means of tests made in water. A model is made of a ship, with funnel, masts, captain's bridge, and all deck erections. This model is then inverted in the tank and so arranged that the same part of the ship is immersed as would be above the water line if the ship were floating the right way up. This model is then towed along at different angles to the direction of motion over a range of low speeds, and the resistance of the water at various points is measured by the lengthening springs on the float to which the boat is attached by wires. The object of the tests is to determine the wind resistance and centre of effort of ship superstructures, with a view to improvement in ship speed and steering.

Experiments in Acoustics.

Another direction in which experiments with water can be adapted to give useful information about air conditions is in the investigation of acoustics. The path of a ripple in water closely resembles that of a sound wave in any one plane, and a small ripple tank on the plan of a vertical section of a town or concert hall has been devised for investigating acoustic reflections. At a place corresponding to the position of a speaker in the hall a disturbance is made in the water and the wave caused and its reflections from the roof can be photographed or thrown on a screen. The hall represented has two balconies, one of which has a roof continuous with that of the main hall, and the other a roof separated from that of the main hall by a short partition extending downwards from the ceiling. One of the problems to be solved concerned the balconies. In which of them could the speaker be best heard? The answer is that unless the hall is very large the audience on the balcony with the continuous roof hear better; where, however, the total path of the sound wave after reflection is greater than the normal path by more than 75 feet, the reflection instead of intensifying the sound will cause an echo, and in a hall of these dimensions the partition is therefore desirable.

Skidding in Motor-cars.

In the engineering department the model motor-cars used in the study of skidding excited interest. They are propelled along a flat surface by a catapult; at a given distance the brakes come into operation and the deviation of the car from the straight path is recorded. Some revision of the current methods of adjusting four-wheel brakes can be anticipated as a practical outcome of these experiments. For example, the retarding force is now generally distributed by manufacturers as two-thirds on the rear wheels and one-third on the front wheels. Experiments suggest that the proportion on the front wheels should be increased. Moreover, though it is now usual for back brakes to be adjusted to lock before the front ones, the model cars are found to keep a straighter course if the front wheels lock first. The importance of keeping the centre of gravity low to avoid the risk of overturning has been shown; also the advantages of a long wheel base in preventing rotation.

The Centre of Gravity in Man.

A model figure wearing a lifebelt of the pattern officially approved was shown floating in a tank in a semi-horizontal position. A very slight adjustment, made through the hollow tube which represented his spinal column, to a small weight in this tube, served to lower this centre of gravity and he assumed the vertical posture. The efficacy of the official belt is confirmed by experiments on this model, which show, however, that the margin which may determine a fatal change of position is narrow. It is interesting to learn that the investigators found considerable difficulty in ascertaining from physiologists the normal centre of gravity of man. Eventually it was obtained from German army figures as 0·54 of his height from the feet upwards, the centre of buoyancy being very nearly the same.

The Equilibrium of Dental Amalgams.

An ambitious programme of work on dental amalgams is being pursued. The amalgams in general use are largely empirical, and are not free from disadvantages. Experiments are in progress in which amalgams of different proportions of metals—for example, silver 29 per cent., mercury 71 per cent., are heated under pressure, in order to determine the thermal critical points, and their associated dimensional changes. It is known that when the dentist has prepared his alloy and inserted it, the equilibrium of the two metals is not stable for a period still to be determined. It is important to ascertain under what conditions either contraction or expansion is to be anticipated in order that the dentist may choose the alloy most suitable to his purpose.

Colorimetric Apparatus.

The apparatus shown in connexion with the measurement of colour includes equipment arranged for determining the properties of the "normal" eye, based on measurements of the spectrum colours by a large number of observers. When this determination is completed it will form a connecting link between the various practical methods of colorimetry and the physical properties of colouring materials, and will establish an accurate standard means of recording a colour by three numbers corresponding to the amount of red, blue, and yellow of which it is composed.

Clinical Thermometers.

The department where clinical thermometers are tested has not made any important changes in technique elaborated in previous years. Since the repeal of the law making compulsory the testing of every thermometer sold to the public, the staff has diminished to about half the number employed during the war. The standard required is not exorbitantly high—an error of less than 0·2 of a degree (Fahr.) does not lead to rejection of any thermometer. The cost to manufacturers of the test is only 3*d.* a thermometer, and if the medical profession urged the public to refrain from buying any thermometer not stamped with the letters N.P.L. at least one source of error in taking temperatures would be avoided.

Medical News.

University of Oxford.—At a congregation on June 8th the following degrees were conferred :—

D.M.—G. I. Evans.
B.M.—R. M. J. Harper, D. C. Shields, M. V. Bhajekar, and H. G. Wells.

Royal College of Surgeons of England.—A meeting of the Council was held on June 13th, with Lord Moynihan, the President, in the chair. It was announced that the Lister Medal for 1930 for distinguished contributions to surgical science had been awarded to Dr. Harvey Cushing, of Boston, U.S.A., and that Dr. Cushing had undertaken to give an address in London on some day in 1930 to be arranged later. It was also announced that the Sir Gilbert Blane Medal for 1929 had been awarded to Surgeon Lieut.-Commander T. N. D'Arcy.

Diplomas of Fellowship were conferred upon the following :—

C. D. Shapland and N. L. White, Univ. Coll. ; J. C. Ainsworth-Davis, St. Bart.'s ; R. C. Taylor, Univ. Coll. ; E. S. Freshman, Manchester ; L. N. Pyrah, Leeds and Guy's ; J. V. O'Sullivan, London ; A. M. Lazarus, St. Bart.'s ; R. M. Bates, London ; A. Simpson-Smith, Guy's ; R. V. Cooke, Bristol and Guy's ; H. P. Nelson, St. Bart's. ; J. F. Simpson, St. Mary's ; N. Attygalle, Middlesex and King's Coll. ; H. J. Burrows, St. Bart.'s ; G. M. FitzGibbon, St. Thomas's ; Vairamuttu Kathirgamatamby, Madras, London, and King's Coll. ; A. K. Gupta, London ; R. W. Kenney, Dalhousie and London ; F. J. Milward, St. Thomas's ; N. M. Matheson, Otago and Middlesex ; R. L. Flett, Otago and Guy's ; S. Howard, London ; M. Axford and H. S. Billcliff, Otago and Guy's ; J. H. Cramsie, Sydney and St. Bart.'s ; D. D. McKenzie, New Zealand and Guy's ; F. E. Stabler, Durham.

Diplomas of Membership were conferred upon the following :—

Nancy M. Badeley, S. T. Crowther, Catherine Day, Margaret L. Hamburger, and L. Nallainathan.

Diplomas in Public Health were granted, jointly with the Royal College of Physicians, to the following :—

Allah Bakhsh and Y. P. Bedi, Royal Inst. of Public Health ; F. G. Brown and J. P. Chaudhuri, Univ. Coll. ; D. S. Chowdhary, Royal Inst. of Public Health ; Gordon Covell, Guy's and Univ Coll. ; S. D. De Vos, H. N. Dewan and D. P. Dutta, Royal Inst. of Public Health ; Nancy G. Howell, Univ. Coll. ; B. S. Kanga, Royal Inst. of Public Health ; G. R. Lynn, St. Bart.'s and R.A.M. College ; Elsie Lyon and D. G. Mobile, Univ. Coll. ; Samuel Mutty, Royal Inst. of Public Health ; C. C. Po, Univ. Coll. ; Marion Ravell, A. E. Schokman, Amarnath Sharma, Patricia H. S. Shaw, and K. A. Soutar, Royal Inst. of Public Health ; H. S. C. Starkey, St. Bart.'s ; G. G. Stewart, St. Bart.'s and Middlesex ; K. M. R. Swami, J. P. R. Tennekoon, and R. L. Tuli, Royal Inst. of Public Health.

At the primary examination for the Fellowship, held from June 4th to 14th, for which 164 candidates presented themselves, 47 were approved. The following are the names and schools of the successful candidates :—

A. H. Baker, M.B., Manchester ; D. S. M. Barlow, M.B., Middlesex and St. Mary's ; A. W. Bayley, M.B., Melbourne and Univ. Coll ; K. B. Bridge, M.B., Otago ; E. Carew-Shaw, M.R.C.S., King's Coll. ; D. O. Clark, St. Thomas's A. A. Davis, M.B., Manchester and Middlesex ; E. A. Devenish, Univ. Coll. ; K. J. Elliott, Edinburgh and Middlesex ; A. L. Eyre-Brook, Bristol ; L. Fatti, M.B., Univ. Coll. ; K. Fletcher-Barrett, M.B., Cambridge and St. George's ; R. J. Furlong, St. Thomas's ; J. Gabe, M.B., St. Mary's and Middlesex ; R. H. Hadley, M.B., Melbourne and Middlesex ; C. S. Hallpike, M.R.C.P., Guy's and King's Coll. ; J. Hardman, Birmingham ; E. A. H. Hindhaugh, M.R.C.S., Univ. Coll. ; O. Hooper, B.M., Oxford and London ; Ruby D. Johnson, Oxford and Univ. Coll. ; E. C. B. Jones, M.B., Melbourne and London ; H. Y. Khwaja, M.B., Bombay and London ; C. E. Kindersley, M.B., St. Bart.'s and St. Mary's ; S. Lal, M.B., Punjab and Middlesex ; M. Lee, M.B., Durham and Middlesex ; M. J. F. McArdle, Guy's ; D. J. MacMyn, M.B., Cambridge and King's Coll. ; D. H. Mitchell, M.B., Melbourne and King's Coll. ; E. W. T. Morris, M.R.C.S., Adelaide and St. Thomas's ; A. B. Pain, M.B., Leeds ; G. T. Partridge, Camb. and St. Bart.'s ; R. S. Pilcher, M.R.C.S., Univ. Coll. ; A. E. Porritt, M.B., Otago and St. Mary's ; C. A. M. Renou, M.B., Melbourne and Middlesex ; L. A. Riddell, M.B., Otago and St. Mary's ; T. O. Sayle, M.B., Melbourne and Middlesex ; H. H. Skeoch, M.B., Sydney and King's Coll. ; J. O. Smith, M.D., Melbourne and Middlesex ; S. B. Smith, Guy's ; F. R. Stansfield, M.B., Leeds ; S. C. Suggit, Univ. Coll. ; B. M. Sundaravadanan, M.B., Madras and London ; G. L. Talwar, Punjab and St. Thomas's ; K. H. Watkins, M.B., Manchester and Middlesex ; F. E. Webster, M.B., Otago ; Eileen M. Whapham, Lond. Sch. Medicine for Women ; H. L. C. Wood, M.B., King's Coll.

The following examiners were elected for the ensuing year :—

Dental Surgery.—(Surgical Section).—Mr. L. Bathe Rawling, Mr. H. S. Clogg, Mr. T. P. Legg, Mr. Russell J. Howard, Mr. Gwynne Williams, Mr. John Murray, Sir Cuthbert Wallace, and Mr. Clement E. Shattock.
Primary Fellowship.—(Anatomy).—Mr. C. P. G. Wakeley, Mr. P. N. Blake Odgers, Prof. William Wright, and Prof. J. E. Frazer ; (Physiology)—Prof. H. E. Roaf, Prof. C. Lovatt Evans, Prof. R. J. S. McDowall, and Prof. John Mellanby.
Conjoint Qualification.—(Elementary Biology).—Dr. T. W. Shore and Prof. J. P. Hill ; (Anatomy)—Mr. J. Basil Hume, Prof. William Wright, and Mr. R. Bramble Green ; (Physiology)—Prof. E. B. Verney and Prof. Hamilton Hartridge ; (Midwifery)—Mr. Clifford White, Mr. T. Berwyn Davies, Mr. Aleck W. Bourne, and Mr. Sidney Forsdike.
Diploma in Public Health.—Dr. C. W. Hutt.
Diploma in Tropical Medicine and Hygiene.—Colonel W. P. MacArthur and Dr. P. H. Manson-Bahr.
Diploma in Ophthalmic Medicine and Surgery.—Mr. C. B. Goulden, Mr. H. Willoughby Lyle, and Mr. R. Affleck Greeves.
Diploma in Psychological Medicine.—Dr. F. L. Golla.
Diploma in Laryngology and Otology.—Mr. W. M. Mollison, Mr. Norman Patterson, and Mr. Walter G. Howarth.

Mr. W. McAdam Eccles was appointed the representative of the College on the British Social Hygiene Council in place of the late Sir Anthony Bowlby.

University of Bristol.—At recent examinations the following candidates were successful :—

FINAL EXAMINATION FOR M.B., CH.B.

Part I. Forensic Medicine and Toxicology only.—A. J. B. Miall, H. M. Strover, and W. L. Sleight.
Part II. *R. A. S. Cory, *R. J. Krogh, Isabella J. Armstrong, A. O. Fisher, and April D. James.
Part II. (Group I.).—N. D. Gerrish and Mabel F. Potter.
Part II. (Group II.).—N. L. Price and †Eric Southam.
* With Second Class Honours. † Completing examination.

FINAL EXAMINATION FOR L.D.S.

C. R. H. Edwards and L. W. G. Jones.

The Parliamentary Secretary to the Ministry of Health, Miss Susan Lawrence, M.P., has appointed Mr. D. C. L. Ward to be her private secretary.

A Motorists' Hospital Badge.—A Motorists' Fund has been opened in aid of Nottingham General Hospital. In return for an annual payment of 10*s.* for a private car, 5*s.* for a commercial vehicle, and 2*s.* 6*d.* for a motor-cycle the owner receives a badge which can be fixed to the vehicle. There are nearly 14,000 motor drivers in the City of Nottingham, and last year 40 persons were killed and 987 injured in vehicular street accidents.

Post-graduate Course at Trinity College, Dublin.—The authorities of the School of Physic, Trinity College, Dublin, have issued the prospectus of their annual post-graduate course, which will begin on Sept. 16th, and last for three weeks. The lectures and demonstrations range over medicine, surgery, and midwifery, with the ancillary specialties, and the teachers include many of the leading specialists in Dublin, as well as the staff of the school. An attractive feature of the course is that members of the class can be housed and boarded in Trinity College on moderate terms, while women members can be accommodated at Trinity Hall.

Oxford Ophthalmological Congress.—As we have already announced, this Congress will be held at Keble College, Oxford, from Thursday, July 4th, to Saturday, the 6th. On Thursday, at 10 A.M., the proceedings will begin with an address by the Master, Mr. Bernard Cridland, after which a discussion on diseases of the lacrymal apparatus will be opened by Prof. Joseph Meller, of Vienna, and Dr. J. S. Fraser, of Edinburgh. After lunch there will be demonstrations in the Scientific and Commercial Museums, and in the evening the annual dinner of the Congress will be held at Keble College. On Friday, at 11 A.M., Miss Ida Mann will deliver the Doyne Memorial Lecture, entitled Some Observations on the Vascularisation of the Vertebrate Eye, and at 3 P.M. Mr. Hugh Cairns and Mr. Charles Goulden will open a discussion on the Ocular Manifestations found in Head Injuries. Saturday morning will be devoted to shorter addresses. Further particulars may be had from the hon. secretary of the Congress, Mr. C. G. Russ Wood, 12, St. John's Hill, Shrewsbury.

North-East Coast Exhibition.—The attention of medical men visiting this exhibition is drawn to the accommodation and facilities offered by the Medical Institute, 7, Windsor-terrace, Newcastle-upon-Tyne.

Extension of Acton Hospital.—Last week Lady Skinner opened an extension of Acton (Middlesex) Hospital. The enlargement comprises a nurses' home, private wards, and administrative offices.

South London Hospital for Women.—A house-to-house collection in Clapham has produced £1000 for the endowment of this hospital on Clapham Common, and recently Princess Helena Victoria, the President, unveiled a commemorative tablet at the head of the bed. The new out-patient's block has cost £65,000, and £28,000 is required to enable it to be opened free of debt.

University of Manchester.—The University Council have appointed Dr. Frank Edward Tylecote to be Professor of Systematic Medicine as from Sept. 29th.

Dr. Tylecote was a student in the Manchester Medical School and graduated as M.B. in 1902 and M.D. in 1904. He has been honorary physician to the Manchester Royal Infirmary since 1914, in which year he resigned his appointment as senior honorary physician to the Salford Royal Hospital. Last year he was the chairman of the Medical Board of the Manchester Royal Infirmary. From 1914–19 he held a commission in the Royal Army Medical Corps (T.F.), and attained the rank of major on the staff of the 57th General Hospital, British Expeditionary Force. He has been a lecturer in clinical medicine in the University of Manchester since 1916, and was elected Fellow of the Royal College of Physicians of London in 1923.

St. Thomas's Hospital.—Speaking at the annual distribution of Medical School prizes by the Duke of Connaught at St. Thomas's Hospital last week, Sir Arthur *Stanley, the treasurer, explained a change of plans respecting* the proposed new Medical School. Instead of building a new out-patients' department on the opposite side of Lambeth Palace-road, as originally intended, it had been decided, for reasons of convenience, to transfer the school to the new site and to transform the existing school into an enlarged out-patients' department. The present accommodation for these patients is totally insufficient. When the hospital was built in 1871 there were 60,000 attendances; last year there were 601,000. There is also urgent need for an enlarged nursing home for middle-class patients, and a site in Paris-street adjoining that of the new Medical School has been secured. The present St. Thomas's Home has 40 beds, always full, and 80 or 100 could be filled.

St. Thomas's Hospital Dinner.—The annual dinner of old students will be held at St. Thomas's House, Lambeth Palace-road, London, S.E., on Friday, Oct. 4th, with Dr. H. G. Turney in the chair.

Harveian Society of London.—The annual dinner of this Society which was held at the Connaught Rooms on June 13th was something of a red-letter day owing to the approach of a centenary celebration and the presence of Mr. G. Buckston Browne, the doyen of the Society. Guests had the opportunity of seeing and examining for themselves a new portrait of Harvey discovered by Dr. C. M. Wilson. Mr. Duncan Fitzwilliams, who occupied the chair, in recalling the aim of the Society to initiate discussion of clinical medicine in its broadest aspect, remarked that Harvey was as much a surgeon as a physician, and one who, like Hunter after him, dissected every imaginable kind of animal. His own particular ambition was to secure publication of the discussions in the form of transactions which could be circulated to the whole medical profession. Sir D'Arcy Power, in proposing "The Society," remarked *on its highly hereditary character, for he had himself been* its secretary 40 years ago, and was the son of a former President, while his neighbour, Sir John Broadbent, was the son of another. The toast of "The Visitors" was proposed by Dr. R. Cove-Smith in a cheerfully provocative vein. Besides those who were to respond, they welcomed at the dinner the Presidents of the other independent medical societies in London, as well as the medical heads of the Navy and of the Air Force. Response was made by Dr. J. Walter Carr, who offered the thrilling suggestion of a guest who had the audacity to refuse when asked to reply; by Lieut.-Colonel C. T. Samman, Master of the Society of Apothecaries; and by Mr. A. P. Herbert, who as a member of the staff of *Punch* described himself as the only Christian among a tribe of cannibals, and one of the few present with a real faith in the medical profession. It was, he said, the only department in public life that had a firm conviction it was making progress. During the evening Mr. Finlay Dunn rendered some amusing skits at the piano with acclamation. The officers of the Society could not be induced to speak for themselves, but due acknowledgment was made to Dr. G. de Bec Turtle, Dr. J. A. B. Hammond, and Dr. H. C. Bull of their share in a happy and well-arranged festivity.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Thursday.—Urology: Summer Meeting, 11 A.M. to 1 P.M. Exhibition of Urological Instruments. 2 P.M., Operations at St. Peter's Hospital, Henrietta-street, W.C. 8.30 P.M., Sir John Thomson-Walker Cinematographic demonstration showing a prostatectomy, litholapaxy and internal urethrotomy.

MEDICO-LEGAL SOCIETY.

Thursday, June 27th (at 11, Chandos-street, Cavendish-square, W.), At the conclusion of the Annual General Meeting a Paper will be read by Dr. Francis Temple Grey on The Medico-Legal Expert in France, followed by a discussion.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.

Wednesday, June 26th.—4.15 P.M., (at St. John's Hospital, 49, Leicester-square, W.C.), Annual General Meeting followed by Clinical Cases.

TUBERCULOSIS ASSOCIATION.

Thursday, June 27th, to Saturday, the 29th.—Provincial Meeting at Medical School, Cambridge.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

Monday, June 24th to Saturday, June 29th.—Medical Society of London, 11, Chandos-street, Cavendish-square, W. M.R.C.P. Course of Lectures, on Tues. and Fris. at 8.30 P.M. Tues., Dr. Harold Pritchard: Diseases of the Pancreas. Fri., Dr. A. F. Tredgold: Mental Deficiency.—Hospital for Epilepsy and Paralysis, Maida Vale, W. Thurs. at 2.30 P.M., Lecture-demonstrations by Dr. W. G. Wyllie on Nervous Disease in Children. No fee.—Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C. Thurs. at 2 P.M., Mr. Harold Kisch: Clinical demonstration in the O.P. Department. No fee. St. Mark's Hospital, City-road, E.C. All-day Course in Proctology, lectures, demonstrations, operations. One week only.—Children's Clinic and other Hospitals. Special two weeks' course in Diseases of Children, occupying most afternoons and some mornings.—Prince of Wales's General Hospital, Tottenham, N. Special post-graduate course in medicine, surgery, and the special departments, for two weeks from 10.30 A.M. to 5.30 P.M. daily.—Further particulars from the Fellowship of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

Monday, June 24th.—2.30 to 5 P.M., Medical, Surgical, and Gynæcological Clinics. Operations.

Tuesday.—2.30 to 5 P.M., Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

Wednesday.—2.30 to 5 P.M., Medical, Skin, and Eye Clinics. Operations.

Thursday.—11.30 A.M., Dental Clinics. 2.30 to 5 P.M., Medical, Surgical, Nose, Throat and Ear Clinics. Operations.

Friday.—10.30 A.M., Throat, Nose and Ear Clinics. 2.30 to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE. Hammersmith, W.

Monday, June 24th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Ward Visit. 2 P.M., Mr. Donald Armour: Operations.

Tuesday.—10 A.M., Medical Registrar: Ward Visit. 2 P.M., Mr. Addison: Operations. 2 P.M., Mr. Sinclair: Surgical Out-patients.

Wednesday.—10 A.M., Dr. Owen: Children's Out-patient Department. 2 P.M., Mr. Tyrrell Gray: Operations. 2 P.M., Dr. Scott Pinchin: Medical Out-patients.

Thursday.—10 A.M., Dr. Grainger Stewart: Neurological Department. 11.30 A.M., Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. MacDonald: Genito-Urinary Out-patient Department.

Friday.—10 A.M., Dr. Pritchard: Medical Ward Visit. 12 noon, Dr. Shaw: Clinical Demonstration. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.

Saturday.—9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Children's Medical Out-patient Department. 10 A.M., Resident Assistant Surgeon: Ward Visit. Medical and Surgical Out-patients at 2 P.M., daily. Operations. Special Departments daily, 10 A.M. to 5 P.M., Saturdays 10 A.M. to 1 P.M. Special Classes in Anæsthetics and Operative Surgery.

NATIONAL HOSPITAL, Queen-square, Bloomsbury, W.C.

Monday, June 24th.—2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Collier: Poliomyelitis.

Tuesday.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Grainger Stewart: Post-traumatic Neuroses (2).

Thursday.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Mr. Just: Demonstration of Methods of Testing the Eighth Nerve.

Friday.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Walshe: Spastic Paralysis.

ST. PAUL'S HOSPITAL, Endell-street, W.C.

Thursday, June 27th.—4.30 P.M., Mr. W. K. Irwin: The Diagnosis and Treatment of Some Important Bladder Conditions.

NATIONAL CAMPAIGN AGAINST RHEUMATIC DISEASES.

Wednesday, June 26th.—5 P.M. (at the Royal Society of Medicine, 1, Wimpole-street, W.). Meeting of supporters. (Chairman: Sir Thomas Horder.)

Appointments.

Alexander, B., M.D., C.M., has been appointed Resident Surgical Officer at the Manchester Royal Eye Hospital.

Brookfield, R. W., M.D., Ch.B. Liverp., D.P.H., Hon. M.O., Royal Southern Hospital, Liverpool.

Little, R. C., M.B., Ch.B. Edin., Certifying Surgeon under the Factory and Workshop Acts for Witham, Essex.

Rae, Harry J., D.S.O., M.B. Aberd., D.P.H., Medical Officer of Health for City of Aberdeen.

Manchester Royal Infirmary: Melland, C. H., M.D., F.R.C.P. Lond., Hon. Physician; and Ferguson, F. R., M.D. Manch., D.P.H., Hon. Asst. Physician.

New Sussex Hospital for Women and Children, Brighton: Neate, Dorothy L., M.B., B.S. Lond., House Physician; Bisset, Susan, M.B., Ch.B., House Surgeon.

Vacancies.

For further information refer to the advertisement columns.

Bath, Royal United Hospital.—Asst. H.S. At rate of £100.

Belgrave Hospital for Children, 1, Clapham-road, S.W.—Asst. P. 50 gns.

Birmingham, Dudley-road Hospital.—Jun. Asst. M.O.'s. Each at rate of £200.

Birmingham General Hospital.—Res. Surg. Reg., &c. £100–£140. Two Res. Anæsthetists. Each £120. Also three H.P.'s. Each £70.

Bolton Infirmary and Dispensary.—H.S. At rate of £150.

Bootle Borough Hospital, Derby-road.—Sen. M.O. Also Two Jun. M.O.'s. At rate of £150 and £125 respectively.

Bradford, Royal Eye and Ear Hospital.—Jun. H.S. £120.

Brighton, Royal Sussex County Hospital.—Two Cas. H.S.'s. Each £120.

Bristol City Mental Hospital.—Third Asst. M.O. £350.

Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—Sen. and Jun. H.S. £120 and £100 respectively.

Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—Asst. S. Two Chief Clin. Assts. Also Res. H.S. At rate of £75.

Chester Royal Infirmary.—H.S. to Ear, Nose and Throat Dept. and Cas. O. £120. Also H.S. £120.

Derby, Guardian's Institution and Infirmary.—Second Res. M.O. £250.

Dublin, Dr. Steevens Hospital.—Resident Surgeon. £150.

Dudley, Guest Hospital.—Hon. Orthopædic Surgeon. Also H.S. and Asst. H.S. £175 and £150 respectively.

Durham County Council.—Asst. Welfare M.O. £600.

East Suffolk Administrative County.—Asst. County M.O. £625.

East Suffolk, Administrative County of.—Asst. County M.O.H. £600.

Essex, Administrative County of.—Asst. County M.O.H. £600.

Evelina Hospital for Children, Southwark, S.E.—H.P. At rate of £120.

Exeter, Devon Mental Hosp., Exminster.—Jun. Asst. M.O. £300.

Exeter, Royal Devon and Exeter Hospital.—Asst. H.S. At rate of £100.

Farringdon General Dispensary, Holborn-circus, E.C.—Hon. Surgeon to Dental Department.

Gateshead County Borough, Mental Hospital, Stannington.—Asst. M.O. £400.

General Lying-in Hospital, York-road, Lambeth, S.E.—Hon. Asst. P.

Gloucester, Gloucestershire Royal Infirmary.—H.P. At rate of £150.

Golden-square, Throat, Nose and Ear Hospital, W.—Hon. Asst. S.

Grange-over-Sands, Westmorland Sanatorium, Meathop.—Med. Supt. £800.

Great Yarmouth General Hospital.—Jun. H.S. £100.

Hellingley, East Sussex County Mental Hospital.—Res. Locum Tenens M.O. 7 guineas per week.

Hosp. for Sick Children, Great Ormond-st., W.C.—Part-time Jun. Cas. O. At rate of £150. Also Res. M.O. for Country Branch Hospital, Tadworth Court, Tadworth, Surrey. At rate of £250.

Hull Royal Infirmary.—2nd Res. H.S., Res. H.S. to Ophth Dept., &c. Each at rate of £150. Also Res. Cas. H.O. At rate of £130.

Ilford Emergency Hospital.—Jun. H.S. £100.

Indian Medical Service.—Recruitment of European Officers.

Ipswich County Borough Sanatorium.—Asst. M.O. At rate of £250.

Ipswich, East Suffolk and Ipswich Hospital.—H.S. At rate of £120.

Leeds, St. James' Hospital.—H.P. and S. £200.

Leicester Royal Infirmary.—M.O. for V.D. Dept. £4 10s. per week.

Liverpool, David Lewis Northern Hospital.—Surgical Tutor. £145.

Liverpool Eye and Ear Infirmary, Myrtle-street.—H.S. to Ophthalmic Dept. £100.

Liverpool Heart Hospital.—Maurice Stern Research Fellowship. £150.

Liverpool University.—Jun. Lecturer. £300.

London, Administrative County of.—Principal M.O.H. to Pub. Health Department. £2000.

London Temperance Hospital, Hampstead-road, N.W.—Cas. O. At rate of £120.

Lowestoft and North Suffolk Hospital.—H.S. £120.

Macclesfield General Infirmary.—Res. H.S. £180.

Manchester University.—Amy Henrietta Worswick Fellowship. £150.

M.A.B. Mental Hospitals Service.—Jun. Asst. M.O. £500.

M.A.B. Tuberculosis Service.—Consulting Laryngologist. At rate of 200 guineas.

Miller General Hospital, Greenwich-road, S.E.—H.P., H.S. Each at rate of £125. Also Pathologist. £600.

Nottingham General Hospital.—Res. Surgeon. £250.

Palestine, Hebron Medical Mission.—Medical Missionary.

Poplar Hospital for Accidents, East India Dock-road, Poplar, E. 2nd Res. O. At rate of £175.

Preston Union.—Jun. Res. M.O. At rate of £104.

Prince of Wales's General Hospital, Tottenham, N.—Hon. Asst. S. to Ear, Nose and Throat Dept.

Princess Louise Kensington Hospital for Children, N. Kensington.—H.S. At rate of £75–£100.

Queen Mary's Hospital for the East End, E.—Hon. M.O. for Electro-Therapeutic Dept. Hon. S. for Orthopædic Dept. Hon. P. for Skin Dept. Anæsthetist. 50 guineas. Also Cas. O. £150.

Queen's Hospital for Children, Hackney-road, E.—Surgeon to Ear, Nose and Throat Dept.

Rochester, St. Bartholomew's Hospital.—Third Res. M.O. At rate of £175.

St. Bartholomew's Hospital.—Asst. Physician and Asst. Director of the Medical Professorial Clinic.

Sheffield City Hospitals.—Res. M.O. £350.

Sheffield, Jessop Hospital for Women.—Three Asst. H.S.'s. Each at rate of £100.

Shrewsbury, Royal Salop Infirmary.—Res. Surg. O. £200.

Stafford, Staffordshire General Infirmary.—H.S. Also H.P. At rate of £200 and £150 respectively.

Stockport Infirmary.—Asst. Aural Surgeon for Ear, Nose and Throat Dept.

Surrey County Council.—Asst. M.O. £600.

Swansea County Borough.—Asst. M.O. £600.

Swansea Hospital.—Res. H.P. £150 to £200. Also Res. H.S. £150.

Truro, Royal Cornwall Infirmary.—H.S. £170.

Tunbridge Wells, Eye and Ear Hospital.—H.S. £150.

University of London.—External Examinerships.

Victoria Hospital for Children, Tite-street, Chelsea, S.W.—H.S. At rate of £100.

Walsall and West Bromwich Union, Great Barr Park Institution. Asst. M.O. £200.

Watford, Herts, Peace Memorial Hospital.—Res. M.O. At rate of £150.

West London Hospital, Hammersmith, W.—Director to Venereal Dis. Dept. £700.

Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. Non.-Res. H.S. At rate of £150.

Weston-Super-Mare Urban District.—Part-time M.O.H. £600.

Willesden General Hospital, N.W.—Res. H.S. At rate of £100.

Wolverhampton Royal Hospital.—Two Surgeons to Ear, Throat and Nose Dept.

Wrexham and East Denbighshire War Memorial Hospital.—Two Res. H.S.'s. Each at rate of £150.

York County Hosp.—H.S. Also Res. Anæsthetist. Each £150.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Chapel-en-le-Firth (Derbyshire).

Births, Marriages, and Deaths.

BIRTHS.

Byworth.—On June 4th, at Savernake, Stanmore, the wife of Dr. Harold A. Byworth, of a daughter

Gillespie.—On June 10th, at a nursing home, Headingley, the widow of Dr. R. K. H. Gillespie, of Headingley, Leeds, of a daughter.

Pridham.—On June 7th, at Hillfield, Broadway, Weymouth, the wife of Dr. J. A. Pridham, of a daughter.

Spackman.—On June 4th, at Coventry-road, Market Harborough, the wife of Dr. E. D. Spackman, of a son.

Thomson.—On June 9th, at Overstrand Mansions, S.W., the wife of Ian S. Thomson, M.D., of a son.

Traill.—On June 7th, at Ottery St. Mary, the wife of R. R. Traill, M.B., B.Ch., of a daughter.

Whitehead.—On June 16th, at Woodfield, Cheadle Hulme, to the wife of Gordon Whitehead, M.B., Ch.B.—a son.

Wilshere.—On June 6th, the wife of Roger G. Wilshere, L.D.S., Sunrise, Grovelands-road, Purley, of a daughter.

MARRIAGES.

Morgan—Thomas.—On June 12th, at Tredergarville Church, Cardiff, T. W. Morgan, M.R.C.S., L.R.C.P., to Dorothy, elder daughter of Mr. and Mrs. Edward Thomas, 7, Winchester Avenue, Cardiff.

DEATHS.

Brand.—On June 11th, at Bellfield, Banchory, William Henry Eden Brand, F.R.C.S.E., D.P.H.

Fawssett.—On June 17th, at High-street, Lewes, Frank Fawssett, M.B., B.S. Lond., M.B.E., aged 64.

Frazer.—On June 13th, at Upton Lodge, Eastbourne, Kenneth Frazer, M.D., aged 71.

Jollye.—On June 3rd, at Brooklands, Hemel Hempstead, Herts, Arthur Dixon Jollye, M.D., aged 57 years.

Tresidder.—On June 13th, at The Waldrons, Croydon, the residence of his sister, William Elliott Tresidder, M.B., B.S. Lond., aged 65.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

HEALTH OF BECHUANALAND.

IN the annual report on the affairs of this Protectorate, signed by Mr. C. L. O'B. Dutton, Government Secretary, it is stated that health conditions during the year ended March 31st, 1928, have been, as regards widespread prevalence of disease, the worst for the past ten years. During the winter of 1927, which ushered in a series of severe outbreaks of fever, following upon cold snaps, the incidence of disease was little less favourable than what is usual at that date. But with the opening and advance of summer there was a sudden rise in the prevalence of fever, which continued to increase until during January, February, and March it had assumed epidemic form and prostrated thousands of the native population. The epidemic was chiefly confined to the southern portions of the Protectorate—especially the alluvial levels—the valleys and low-lying granitic areas, abutting on the main watersheds—Molepolole, Mochudi, Gaberones, Ramoutsa, and Gopane.

Associated with this extensive prevalence of malaria were the invariable complications of influenza and bronchial catarrhs—bronchitis, acute pneumonia, rheumatic affections, enteritis, and the common sequelæ. The total returns of disease, which are the heaviest on record (close upon 20,000 cases), have been swelled to these unusual proportions by the record of many ailments, concurrent and otherwise, which the increased medical activities in connexion with the epidemic brought under observation.

Free Government supplies of quinine were issued to the areas most severely affected. And this, together with measures of supervision of distribution and energetic medical attention, helped to mitigate the effects of this disease. A fortunate and remarkable feature of the epidemic was the low rate of mortality. At Mochudi, where over a thousand cases of malaria were seen, there were only two deaths, and these of indirect or remote connexion. At Gaberones, Molepolole, Ramoutsa, and Gopane, where the numbers were still greater, the death-rate was equally low in proportion. The epidemic outbreaks were largely determined by the conditions prevailing over the southern Protectorate throughout the summer—that is, heavy rains at long intervals, over the impervious, low-lying, and easily water-logged areas; the constitutional lack of stamina of the people on the low-lying lands as against those on the higher levels—which is a long observed and constant factor—invariably shows up under unusual meteorological conditions, such as heavy rains or severe cold snaps.

Of other epidemic and infectious diseases the returns for the year show: anthrax 15 cases (1 death); dysentery, infantile or undefined diarrhœas, 627 cases; influenza, 257 cases; tuberculosis, 142 cases; puerperal fever, 2 cases; leprosy, 16 cases; enteric fever, 8 cases (1 death); tetanus, 2 cases (1 death); cerebro-spinal meningitis, 5 cases; scarlet fever, 1 case; measles, 13 cases; and a few cases of whooping-cough, mumps, and chicken-pox. The tuberculous cases generally gave a history connecting the origin of the disease with working on the Rand mines, whilst the unusual outbreaks of enteric fever were clearly traced to the Lichlenburg diamond diggings. There has been an increase in the number of syphilitics treated, the returns for the various districts showing an aggregate of 4782 attendances.

During the month of November water was struck on the site selected for the Serowe Hospital. Subsequent tests have proved the supply to be ample, and as the bedrock is pure sandstone, the supply is not likely to vary or be affected by drought. The work of clearing the site and fixing the position of the hospital and accessory buildings has since been put in hand, the hospital plans reviewed and adopted in final form, and it is intended that the new hospital shall be finished, equipped, and staffed during the next financial year.

The position with regard to the extension of plague and the proximity to the Protectorate borders of suspected and proved infection gave cause for increased vigilance, and at the end of the financial year measures were under consideration for taking practical steps, during the coming summer, towards conducting a rodent-infected survey of the Protectorate along the boundaries of possible approach.

The territory of the Bechuanaland Protectorate is bounded on the south and east by the Union of South Africa, on the north-east by Southern Rhodesia, on the north and on west by the territory of South-west Africa. It has not been surveyed as a whole, but its area is estimated at 275,000 square miles. Its mean altitude is about 3300 ft.

A CASE OF ENURESIS.

To the Editor of THE LANCET.

SIR.—In reply to "Puzzled," when I meet such a case as this I give a suitable gland compound; if the patient is cured, I am right, if not, no harm is done. Generally some good results. Using thyroid gland alone, I have had at times to stop it, as unpleasant symptoms arose, but this has never occurred with a gland *compound* tablet, such as Dynotabs Thygon-Spermin. 106 (to be obtained from Hormones and Chalones, 27, Cavendish-square, W.1). I offer the suggestion that if the system needs a gland extract it absorbs it; if it is not required it is simply passed out by some safety valve.

I am, Sir, yours faithfully,

C. G. S. BARONSFEATHER, M.D.

Bournemouth, June 15th, 1929.

CARE AND TREATMENT OF THE PATIENT.

Dr. Emerson has brought together here nine essays[1] by well-known American authorities, the origin of the work being the establishment of a set of lectures in the Harvard Medical School dealing with the personal care of the patient by the physician. The following well-known teachers have contributed to the volume: Dr. David L. Edsall, Dr. C. F. Martin, Dr. W. S. Thayer, Dr. Austen Fox Riggs, Dr. Franklin G. Balch, Dr. Lawrence K. Lunt, and Dr. Alfred Worcester. One of the most useful essays is entitled "The Medical Education of Jones by Smith," and purports to be introduced by Dr. Thayer. The characters may be imaginary but the precepts have the ring of being founded upon reality. Whether "Smith" is "Jones," whether either is Prof. Thayer, and who was "Fowler" are questions the answers to which could probably be provided at Harvard, but the personalities have no significance, which is exactly what the teaching possesses. It is interesting to read Dr. Alfred Worcester's chapter on the care of the aged alongside the section in Dr. David Tindal's book on the treatment of the aged (see below) for the obviously learned American and the delightfully simple Englishman provide sensible teaching between them, each supplying notes that are lacking in the pages of the other.

Dr Tindal[2] has set down in his "Gleanings from General Practice" the results of long experience as an urban practitioner, in the hope that they may prove of service to young members of the profession. We may say at once that his gleanings are useful while his advice is sound. Wise remarks on professional conduct, some of which are so obvious that they are perhaps needless, lead to chapters on treatment generally, treatment of children and of the aged, and where, as not infrequently happens, part of the treatment is connected with diet, reference is given to a useful section of the book containing notes on cookery and the serving of meals in the sick-room. The last 50 pages of the book are taken up with formulæ, the prescriptions being directed generally or specially towards the relief of common conditions. Certain preliminary reflections of the author, which point to the absence of instruction given to-day to students in regard to the conduct of practice, justify the issue of this unpretentious work.

PHARMACEUTICAL LATIN.

A COMPACT little book,[3] measuring only 6½ by 4 inches, provides the pharmaceutical and medical student with a concise Latin grammar and a list of phrases and abbreviations used in prescriptions, a few exercises and examples of prescriptions, and a Latin-English vocabulary. After absorbing its contents the student should be well primed. He will note that O.o.o. stands for the best olive oil (oleum olivæ optimum) and that S.o.S. to a pharmacist is a call for help only if there is need (si opus sit). M.d. means as directed (more dicto) and M.p. is a pill mass. The reaction of a grocer to the precious student who asks for pastille as "coni odorati" or for a packet of isinglass as "colla piscium" might be alarming. Incidentally, for isinglass most dictionaries prefer the Greek "ichthyocolla." "Cascara sagrada," which is included in the Latin-English vocabulary and explained as cascara, bark, sagrada, adj. sacred, is really pure Spanish, except that the first a has an accent in that language. The word cortex, bark, is included in its proper place. Vehiculum is described as vehicle. The explanation might have been extended by adding "excipient or medium." Ne tr. s. num. (ne tradas sine nummo) seems to be the druggist's way of saying what other tradesmen more simply call "C.o.d.", but then the druggist keeps a "taberna" and not a shop. The book will be useful especially to students near qualification whose powers of writing prescriptions are too often limited to a quotation of the name of the mixture in the Hospital Pharmacopœia deemed most nearly appropriate to the patient's condition.

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[1] Physician and Patient: Personal Care. Edited by L. Eugene Emerson. Harvard University Press. London: Humphrey Milford, Oxford University Press. 1929. Pp. 244. 11s. 6d.

[2] Gleanings from General Practice. By David Tindal, M.D., F.R.F.P.S. Glasg. London: Baillière, Tindall and Cox. 1929. Pp. 209. 6s.

[3] Aids to Pharmaceutical Latin. By G. E. Trease, Ph.C., Lecturer in Pharmacognosy, University College, Nottingham. London: Baillière, Tindall and Cox. 1929. Pp. 168. 3s. 6d.

An Address

ON THE

NATURAL ACQUIREMENT OF IMMUNITY.

Delivered at the Institute of Pathology and Research, St. Mary's Hospital, on May 23rd, 1929,

BY W. W. C. TOPLEY, M.D. CAMB., M.Sc. MANCH., F.R.C.P. LOND.,

PROFESSOR OF BACTERIOLOGY AND IMMUNOLOGY IN THE UNIVERSITY OF LONDON, AT THE LONDON SCHOOL OF TROPICAL MEDICINE AND HYGIENE.

THE natural acquirement of immunity is a well-worn theme; but current bacteriological literature displays a curious diversity of opinion with regard to the relative importance of the various factors which are, or may be, involved. There is general agreement as to the essential mechanism of antitoxic immunity; but widely divergent views are held about the relative significance of heredity and individual experience in determining the antitoxin production on which such immunity depends. Far less agreement has been reached upon the nature of acquired resistance to those tissue-invading bacteria which do not produce powerful exotoxins. There is an orthodox view, which was slowly evolved during the controversies between the cellular and humoral schools, and emerged in its present form from the synthesis which followed the demonstration that efficient phagocytosis depends on the direct action of antibodies on the bacterial cell. There are less orthodox views. Some would jettison the cellulo-humoral hypothesis in favour of a local tissue immunity in which antibodies play no part. Others would relegate it to a position of quite minor importance, assigning the dominant rôle to some other intrinsic or extrinsic factor. This particular problem of specific antibacterial immunity merits, as it seems to me, reconsideration in the light of recent advances in our knowledge of antigen-antibody reactions in general; since the observations in question lend strong support to our established conceptions, help to explain many anomalies which have encouraged the grosser forms of heresy, and suggest hopeful avenues for future research.

SOME TENTATIVE CONCLUSIONS.

Most of us, I suspect, have formed the habit of reading the conclusions of a paper first, and then turning to the paper itself to see whether we agree with the judgment on the evidence. This method has certain advantages in presentation as well as in reading; and it may simplify matters to set out the conclusions which seem to me to be supported, more or less strongly, by the available data, and then to attempt to justify these conclusions by a brief reference to the evidence on which they are based. They may be stated as follows:—

1. The acquirement of specific antibacterial immunity depends, in the main, on the production of specific antibodies which sensitise the bacterial cell. The sensitised bacteria are more readily ingested by the phagocytic cells of the tissues, and are, in some cases at least, acted upon by other non-cellular agents, which destroy them, or inhibit their invasive activity. These specific antibodies are themselves produced, or increased significantly in amount, in response to the entry into the tissues of bacteria which contain the corresponding antigens.

2. These antibodies are of one kind only, in the sense that for each antigen there is one, and only one, corresponding antibody.

3. In any pathogenic bacterium, on the other hand, there are several antigens; and these antigens are of unequal importance in immunity reactions in vivo. The presence of the antibody corresponding to one particular antigenic component may profoundly modify the course of events in favour of the host. The presence of the antibody corresponding to another antigenic component may be without effect. This difference in the immunological significance of different antigens probably depends on their position in the bacterial cell. The acquirement of specific antibacterial immunity depends on the production of antibodies acting on the effective bacterial antigens.

4. The condition of an animal which has acquired immunity differs from that of a normal animal not only in the presence of the effective specific antibody in its blood and body fluids, but in the readiness with which this antibody is produced in response to further stimuli, and perhaps in the presence of fixed antibody in certain cells and tissues.

5. During the process of natural immunisation foci of infection are established in the tissues, and these may persist over long periods of time. The animal is, however, relatively immune to fresh infections from without, and to the spread of infection beyond the localised foci. This specific immunity depends on the maintenance, at a high level, of the clearing mechanism of the tissues, which ensures the prompt removal of any bacteria which gain access to the lymphatics or blood-vessels. It may be overcome, either by massive infection from without or by the action of various non-specific factors, which cause a spread of infection from the latent foci.

6. The available evidence does not suggest that the bacteria in such latent foci become avirulent. In some cases, at least, they may retain their full virulence over long periods of time.

SPECIFIC PROTECTIVE ANTIBODIES.

Taking these points in order, it may first be noted that the critical experiment of passive protection with the serum of an immunised animal has been so frequently repeated from the days of Pfeiffer onwards that no reasonable doubt remains that active immunity is associated, in many cases, with the presence of protective antibodies in the blood. These protective antibodies are, moreover, specific; as has been shown by Pfeiffer[1] and his colleagues for the cholera vibrio, by Neufeld and Handel[2] for the pneumococcus, and by a host of other workers. The objections to the view that active antibacterial immunity is always associated with this type of reaction may be classed under two headings: (1) there are cases on record in which an animal has been actively immunised without the appearance of protective antibodies in its blood; (2) there have been repeated failures to correlate the protective power of a serum with its antibody content, as estimated by some in vitro test. Both these objections can be considered more conveniently at a later stage; meanwhile it may be noted that the second objection does not suggest doubts as to the presence of protective antibodies, but merely as to the identification of these antibodies with those which are measured by the particular in vitro test employed. That protective sera commonly contain antibodies which promote phagocytosis, in vitro and in vivo, and in some cases give rise to the phenomena of bacteriolysis, has been demonstrated by innumerable experiments. Recent studies on the bactericidal power of the whole blood, or of serum-leucocyte mixtures, have demonstrated the action of this mechanism in cases in which it had not been revealed by the methods previously employed. It is, of course, possible that the sensitisation of bacteria by the serum antibodies may have other secondary effects, of which we have as yet no knowledge.

THE UNITARIAN CONCEPTION OF ANTIBODIES.

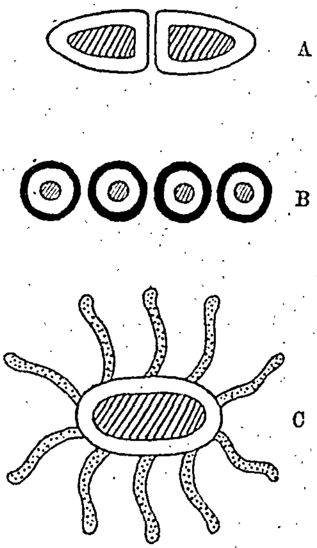
Secondly, the antibodies are of one kind only. It is, perhaps, premature to suggest that agreement has been reached on this point; but I do not think there is any doubt that the views sponsored by Dean[3] in this country, by Zinsser[4] in America, and by Nicolle and Césari[5] in France, are steadily gaining adherents. The most convincing experimental evidence in favour of this unitarian conception is probably that provided by Dean's[6] well-known studies on the relation between precipitation and the fixation of complement. His earlier results have been elaborated and extended by his more recent studies with Webb[7] on the importance of the quantitative relations between antigen and antibody in the precipitin reaction, and by the work of his colleague Goldsworthy.[8] It is now fairly clear that complement-fixation is an adsorption process which occurs during a particular stage of the flocculation of the serum-globulins, and that it is possible, by adjusting the time relations and the antigen-antibody ratio, to demonstrate either phenomenon, or both, in the case of any soluble antigen and the corresponding antiserum. The unitarian hypothesis, in its generalised form, would deny the existence of agglutinins, lysins, precipitins, opsonins, &c., as separate entities; in the moribund terminology of the side-chain theory it would deny the existence of ergophore groups with different functions, and would regard each antibody as a sensitising substance in Bordet's sense. This sensitising substance, by combining with its corresponding antigen, renders it sensitive to various environmental conditions to which it was before indifferent. The exact happenings in a test-tube, or in the animal body, will, according to this view, depend on various secondary factors. If electrolytes are present, a sensitised bacterium will be agglutinated, or the colloidal compound formed by a soluble antigen and its corresponding antibody will be precipitated. If the antigen is incorporated in a cell, and complement is present, the cell may be lysed. If phagocytes are present, the sensitised cells will be ingested. This hypothesis does not, of course, suggest that one antibody, and one only, is produced when a complex antigenic material, such as a bacterial suspension, is injected into an animal. It suggests that, for each antigenic component, there is one, and only one, corresponding antibody. We may, in the light of the data to be discussed in the next section, take this argument a step further, and suggest that the functional specificity which was formerly attributed to the antibody, belongs, in the case of organised cells, to the antigen.

THE IMMUNOLOGICAL SIGNIFICANCE OF DIFFERENT ANTIGENS.

Thirdly, the antigenic structure of all those bacterial species which have been adequately examined has been shown to be complex; and evidence is rapidly accumulating which suggests that the different antigenic components, contained in any bacterial cell, vary widely in their immunological significance. It is impossible, in a brief sketch of this kind, to give an adequate review of the available data. The recent studies of Arkwright,[9] Andrewes,[10] Weil and Felix,[11] Orcutt,[12] White,[13] and others on the antigenic components of bacteria of the coli-typhoid group, combined with the earlier observations of Smith and Reagh[14] on somatic and flagellar antigens; the work of Avery, Heidelberger[15] and their colleagues on the antigens of the pneumococcus; and the studies of Lancefield[16] and of Todd[17] on the serological behaviour of the hæmolytic streptococci, have together provided a framework on which we may construct a model of the antigenic structure of the bacterial cell.

In Fig. 1 the picture which emerges from these various studies is represented in diagrammatic form, taking as illustrative instances the pneumococcus, a hæmolytic streptococcus, and a motile bacillus of the coli-typhoid group. In each case the fully virulent type of organism has been depicted, and no indication has been given of possible antigenic variations, since these do not concern the question immediately at issue. It should, however, be noted that, in the pneumococcus, and in the bacilli of the colon-typhoid group, rough variants may be obtained which have lost the somatic polysaccharide antigen which is characteristic of the normal smooth forms. The occurrence of these variants has rendered possible the separate study of the immunological significance of the two somatic antigens. At A is represented a pneumococcus, possessing a type-specific polysaccharide antigen, and a nucleoprotein antigen. In this particular case the spatial relations of these two components is clearly evidenced by the collection of the polysaccharide at the surface in the form of a capsule, covering the nucleoprotein antigen within the cell. At B is depicted a virulent hæmolytic streptococcus, with three antigenic components: a nucleoprotein antigen within the cell, a polysaccharide antigen represented as lying in an intermediate zone, and a third antigen, which is regarded by Lancefield[16] as an acid-soluble protein, shown as a surface layer. In this case we are arguing from analogy in placing the third antigenic component, which determines type-specificity, at the surface of the cell; but the analogy, which is afforded by the observations of Todd and of Lancefield on virulence and immunological behaviour, is sufficiently strong to render it highly probable that this spatial relation holds true. The distribution, within the streptococcal cell, of the polysaccharide and nucleoprotein components is, in this case, more doubtful. At C is represented a flagellated bacillus, possessing three major antigenic components, one limited to the flagella; a second, probably polysaccharide in nature, forming part of the bacterial body and represented at its surface; and a third, probably nucleo-protein in nature, situated within the bacterial body and covered by the polysaccharide component.

FIG. 1.



In constructing this diagram I have adopted the tentative suggestion, contained in a recent paper by White, that the smooth virulent forms of bacteria of the salmonella group contain the nucleo-protein component of the rough variant, masked by the specific polysaccharide somatic antigen.

The Significant Antigens in Various Infections.

In each of these three cases there is evidence that one particular antigenic component—and that the one which is probably distributed at the surface of the bacterial cell—is mainly concerned in the *in vivo* reactions which determine resistance to infection. The case of the pneumococcus is too well known to require any detailed reference. Whether we take the example of passive protection in the mouse, of serum-therapy in man or the monkey, of active immunisation against experimental infection in animals, or of prophylactic vaccination in human herds, the answer is the same: immunity is type-specific. The antibodies corresponding to the polysaccharide antigens play a dominant rôle. The antibody corresponding to the nucleo-protein antigen has little if any protective power. In this connexion two related problems may be briefly referred to. As noted above, there have been numerous failures to demonstrate a correlation between antibody-content and protective power in comparing different samples of antibacterial sera. In the particular case of the pneumococcus it seems possible that this discrepancy has arisen through the unsatisfactory methods employed in titration. It is altogether doubtful whether any valid comparison can be drawn between the agglutinin titre of different sera and the number of bacteria against which a fixed amount of each of those sera will protect. It is of interest to note that recent studies by Friedlander, Sobotka, and Banzhaf[18] in which the protective power of the various sera has been titrated by the dilution method, and the antibody-content by determining the antigen-antibody ratio in precipitating mixtures of serum and purified polysaccharide antigen, show a close relation between the content in type-specific antibody and the power to protect. Again, in this particular case there is little evidence of any protective antibody other than that corresponding to the type-specific antigen; since, if such other antibodies played an important part in active or passive antipneumococcal immunity, we should have to suppose that the corresponding bacterial constituents differed in each serological type, and that they were in each case firmly linked to the polysaccharide antigen, an assumption for which there seems little warrant.

In the case of the hæmolytic streptococcus, the recent studies of Lancefield and Todd[17] indicate that the significant antigenic component is the acid-soluble protein. Antisera acting on this component are protective; antisera acting on the polysaccharide or nucleoprotein components are not.

In the case of the flagellated bacilli of the colon-typhoid group, Felix[19] has suggested that the somatic antigen of the normal smooth form is the significant component in immunity reactions in vivo. Arkwright's[20] studies on typhoid and paratyphoid infection in the guinea-pig supported this view. Observations by Springut[21] on *B. aertrycke* infection in the mouse suggested that the flagellar antigens played a larger part than Felix or Arkwright had supposed. A more recent study of the same infection by Ibrahim and Schütze[22] yielded results which, while differing in certain details from Springut's findings, were in general conformity with the conclusion that the flagellar antigens played some part in the immunising reaction; though, as the authors are careful to point out, the procedure employed to inactivate these antigens may have weakened the antigenic value of the somatic component.

The Importance of the Somatic Antigen.

In connexion with the study of epidemic infections in mice, Prof. Major Greenwood and I have investigated the immunising value of various bacterial vaccines, so selected and prepared as to allow us to differentiate the effect of the various components in question. In order to obtain the somatic (O) antigen without the flagellar (H) component we resorted to a vaccine consisting of a suspension of *B. paratyphosus* B. This species, as White[23] has shown, shares with *B. aertrycke* a common O antigen. As regards its flagellar antigen it is, as Andrewes has demonstrated, diphasic, possessing, in the group phase, an antigen which is identical with that of the group phase of *B. aertrycke*; but the type phases of the flagellar antigens of these two species are entirely distinct. It seemed unlikely, a priori, that the group flagellar antigen would exert any significant effect; since, as we have shown elsewhere, the type phase appears to be dominant in all epidemics of mouse typhoid. It was, however, a simple matter to obtain direct evidence on this point by preparing two vaccines of *B. paratyphosus* B, one in the group, the other in the type phase. As a further precaution against the presence of traces of group antigen in the latter, the flagellar antigen was removed by alcoholic extraction. The actual vaccines employed in this series of tests, and their antigenic components, are sufficiently indicated in Table I. The rough somatic antigen is not included among the factors tabulated, since its actual distribution is, at the moment, uncertain. The point is not of great moment. There is general agreement that this antigen has no immunising value, a conclusion which is fully borne out by our experience with the rough aertrycke and rough typhoid vaccines. In order to obtain a measure of any purely non-specific immunising effect, which might arise from the intraperitoneal injection of a killed bacterial suspension, we included in our series a staphylococcal vaccine, which, of course, bears no antigenic relationship to the causative organism of the epidemic.

TABLE I.

Group.	Vaccine.	Antigen.	Average daily specific death-rate.	Average daily specific death-rate as per cent. of normal mice.
C	Aertrycke. (S.s.; H.+F.)	O+H (group+type)	0·0188	59·7
F	Para. B. group. (S.s.; H.+F.)	O+H (group).	0·0196	62·2
G	Para. B. type. (alcoholised.)	O.	0·0200	63·5
E	Aertrycke. (Broth culture: H.+F.)	O+H (group+type)	0·0211	67·0
D	Aertrycke rough type. (S.s.; H.+F.)	H (type+ some group).	0·0262	83·2
B	Typhoid rough. (S.s.; H.+F.)	—	0·0272	86·3
A	Staphylococcus. (S.s.; H.+F.)	—	0·0274	87·0
N	No vaccine—Normals added daily.	—	0·0294	92·1
H	No vaccine—Normals added with A—G.	—	0·0315	100·0

(S.s.; H.+F.) = Saline suspension; heat + formalin.

The test of immunity, in this particular experiment, was provided by exposure to risk of infection in a cage in which an epidemic was spreading. The epidemic was initiated in the usual way; three normal immigrants were added to the cage each day; and, every seventh day, an additional 80 mice were added—ten normals and seven groups of ten vaccinated mice. The latter had received two inoculations, each of 500,000,000 bacteria, of the seven vaccines under test. The two doses were given intraperitoneally, with a week's interval between them, and the mice were added to the cage one week after the second dose. The experience is as yet incomplete, and the figures recorded in the table refer only to the earlier phases of the epidemic. The number of mice in each group—200 in the case of groups A to H, and some 400 in group N—are, however, sufficiently large to make the differences observed statistically significant. It will be noted that the measure of resistance adopted here has been the daily specific death-rate—i.e., the death-rate calculated from the deaths in which *B. aertrycke* was isolated post mortem, *together with those deaths in which* cannibalism prevented a post-mortem examination. The death-rate is expressed in the usual life-table form, and, in the last column, the death-rate for each group is expressed as a percentage of the death-rate among the normal mice added to the cage on the same day as the vaccinated animals.

The results are fairly clear-cut. The death-rate among the normals added daily (group N) serves as a check on that among the H group—there is no significant difference. Groups A, B, and D show no significant difference inter se. It would appear that the intraperitoneal injection of any bacterial suspension confers a minor degree of temporarily increased resistance (group A), but that nothing further is gained by the presence of the rough somatic antigen (groups B and D), or of the flagellar antigen in its type phase (group D). The figures for groups C, F, G, and E are again fairly homogeneous inter se; they show a decided advantage as compared with the normal mice, or with the three vaccinated groups A, B, and D. The mice of each of these more resistant groups had received the O somatic antigen. It appeared to be immaterial whether this compound was administered alone (group G), in association with flagellar antigen in the group phase (group F), or with both group and type phases (groups C and E).

In Table II. the figures are combined in such a way as to show the effect of each component over the period in question, the group phase of the flagellar antigen and the rough somatic antigen being omitted from consideration. The results are of exactly the same order; and it seems clear that, under these

TABLE II.

Combined groups.	Antigen.	Average daily specific death-rate.	Average daily specific death-rate as per cent. of normal mice.
F and G.	O alone.	0·02298	64·8
C and E.	O+H.	0·02349	66·0
C, E, F and G.	O present.	0·02318	65·4
D	H alone.	0·0262	83·2
A, B and D.	O absent.	0·02961	83·6
A and B.	Non-specific.	0·03018	85·2
H.	Non-vaccinated	0·0315	100·0

conditions, the O antigen is the single significant factor in producing specific immunity against *B. aertrycke.*

In Vitro Reactions.

To these studies of experimental infection in vivo we must add the results recorded by various observers who have studied antigen antibody reactions in vitro. We know that the type-specific antibodies determine opsonification as well as agglutination of the pneumococcus. Recent studies have indicated that, in the motile bacilli of the paratyphoid group, the antibodies acting on the somatic O antigen are responsible for the phenomena of bacteriolysis (Felix,[19] Felix and Robertson[23]) and of opsonification (Braun and Nodake[24]), while the H antibodies play little part in those reactions. To complete the picture we may include, as supporting evidence, some of the facts which have emerged during recent studies on bacterial variation. The loss of the polysaccharide antigen by the pneumococcus, leaving the nucleoprotein component exposed, leads to the appearance of the rough avirulent variant. The loss of the polysaccharide O antigen by virulent smooth strains of bacilli of the colon-typhoid group, has a similar effect (Arkwright,[9] White,[18] Topley and Ayrton[25]); while there is ample evidence that the non-motile O forms, which have lost their flagella but retain the polysaccharide somatic antigen, are fully virulent. In the case of hæmolytic streptococci loss of virulence is associated with loss of the acid-soluble protein component, which determines type-specificity (Todd and Lancefield[26]).

If we survey this picture as a whole, its outlines, though sketchy and incomplete, seem highly suggestive. The reactions between an invading bacterium and the cells and tissue-fluids of the host must occur in the first place at the bacterial surface, and on the nature of that surface the virulence of the bacterium would appear mainly to depend. If the surface is of such a kind as to endow the bacterium with the property of virulence, when it gains access to the tissues of a susceptible animal, that animal may develop resistance by producing antibodies which attach themselves to that surface, and so alter its physical or chemical properties. Antibodies which react with antigenic components situated in bacterial appendages, such as flagella, or deeply within the bacterial cell, are ineffective from this point of view. Such a tentative hypothesis is, I think, in conformity with the known facts. It has, for instance, long been recognised that the titration of one particular serum antibody, such as an agglutinin, does not of necessity provide a measure of the resistance of the animal whose serum is examined, nor of the power of that serum to confer passive protection; and this apparent anomaly is clearly due, in some cases, to the fact that a flagellar antibody agglutinates but does not protect. It is of some interest to note that the findings of Wright[27] and his colleagues, that the antibody effects which provide the best measure of resistance are opsonification and bacteriolysis, are in entire conformity with the more recent observations referred to above.

IMMUNITY WITHOUT DETECTABLE ANTIBODIES.

Fourthly, while the mechanism with which we are here concerned depends on the presence in the animal tissues of an antibody acting on a particular bacterial antigen, or on the capacity of the tissue cells to produce such an antibody promptly in response to the stimulus provided by bacterial invasion, a significant degree of immunity may be acquired without the appearance of the antibody in question in the circulating blood, in concentrations detectable by the in vitro tests commonly employed. The recent studies of H. D. Wright[28] on antipneumococcal immunity in the rabbit provide an excellent example of this phenomenon. The point is an important one, because the conclusion that the O antibodies are the significant factor in antibacterial immunity has led in one particular instance to a further conclusion, which appears to me to be unfortunate and unjustifiable. Felix[19] and his colleagues have found that persons who have been inoculated with typhoid and paratyphoid vaccines do not develop O agglutinins to a titre of 1 in 100 or over; though, as is well known, they develop H agglutinins to a high titre. From this it has been concluded: (*a*) that antityphoid vaccination does not stimulate the production of O antibodies; (*b*) that antityphoid vaccination is therefore incapable of increasing resistance to infection. I would suggest that this is an example of a conclusion which carries its own refutation. There may be differences of opinion as to the degree of effective immunity which antityphoid inoculation confers; but the existence of a significant difference in the morbidity rates among inoculated and uninoculated samples of the population is attested by extensive data, which fulfil all the ordinary statistical criteria. In fact, as Gardner[29] has recently shown, the conclusion is not valid because the premises are false. Inoculation with typhoid vaccine does stimulate the production of O antibodies, though the titre attained is far lower than that reached by the H agglutinins. The study of the prophylactic value of various vaccines in an epidemic of mouse typhoid, to which I have referred above, enabled us to obtain further light on this particular problem. In order to ensure a constant number of mice in each vaccinated group, it was necessary to inoculate 12 to 15 mice, instead of the ten which would be required for addition to the cage; thus, on the day when the additions were made, we were left with a few superfluous mice in each inoculated group. These were anæsthetised, and as much blood as possible was collected. The serum was tested against three suspensions of *B. aertrycke*, so selected and prepared as to respond to flagellar agglutinins corresponding to the type or group phase, or to the O agglutinin. Each serum was tested against each suspension, in dilutions varying between 1:20 and 1:640. Table III. shows the number of mice so examined in each group, and the number of these which agglutinated each of the bacterial suspensions at a titre of 1:20 or over. It will be noted that the four vaccines, C, E, F, and G, which were known to contain O antigen, and which induced a significant degree of immunity, did in fact possess some power of stimulating the formation of O antibodies; but it will also be noted that this response, as revealed by our agglutination tests, was minimal. Only one of 66 mice inoculated with vaccine E showed O agglutinins at a serum dilution of 1:20, while the best response, obtained with vaccine F, produced agglutinins active at this titre in only 10 of 52 mice. It may be added that more extensive experience has amply confirmed these findings. Table III., when compared with Table I., affords clear evidence of the uselessness of H agglutinins. The mice of group D, which had produced H agglutinins in plenty, showed no evidence of specific immunity. The mice of group G, possessing O agglutinins only, showed the same increase in specific resistance as those of groups C and E, which possessed flagellar agglutinins active against each phase. We may conclude that, in the case of mice and men, the injection of O antigen in the usual form of a killed bacillary suspension, leads to the production of O antibodies in minimal amount; and that this minimal response, even

TABLE III.

Group.	Vaccine.	Number of mice.	Number agglutinating.		
			H (type).	H (group).	O
C	S. Aertrycke (saline)	59	58	59	4
E	,, (broth).	66	65	64	1
D	R. Aertrycke.	61	59	36	0
F	Para. B (group).	52	0	52	10
G	,, (type).	63	0	0	6
A	Staphylococcus.	70	0	0	0
B	R. Typhoid.	72	0	0	0

though it does not result in the appearance of circulating antibodies in a detectable concentration, is associated with a significant increase in the resistance of the inoculated animal. It does not, of course, follow that a vaccine so prepared as to possess a greater power of stimulating O agglutinins would not induce a more effective increase in resistance. It seems possible that work along these lines would yield valuable results.

THE PERSISTENCE OF FOCI OF INFECTION DURING THE PROCESS OF NATURAL IMMUNISATION.

Fifthly, the type of immunity so acquired is not of such a kind as to ensure the sterilisation of the tissues. If the immunity is artificially induced, as by the inoculation of an appropriate vaccine, the animal may withstand a subsequent inoculation of virulent bacteria, yet these bacteria may in many cases be recovered from the spleen several weeks later. When the immunity is naturally acquired, as by the experience of a mild or latent infection during the course of an epidemic, the bacteria which provided the stimulus to antibody production may apparently remain latent within the tissues over long periods of time. So far as the particular example of mouse typhoid is concerned, each of these propositions has been established by numerous experiments. The figures set out in Table IV. illustrate sufficiently the type of immunity established by the inoculation of two doses of vaccine containing the O antigen. One week after the second inoculation the vaccinated mice, and a similar number of controls, were inoculated intraperitoneally with 1000 *B. aertrycke.* It will be noticed that the increased resistance of the vaccinated mice is evidenced in two ways: (*a*) those that succumbed to the infection lived, on the average, about three times as long as the controls; and (*b*) about 40 per cent. of the vaccinated mice survived in apparent health throughout the period of observation. When, however, the survivors were killed and examined on the 28th day, about half of them were found to be harbouring *B. aertrycke* in their spleen tissue.

TABLE IV.

Exp.	Mice.	No.	Died within 28 days	Average time to death in days.	Survived 28 days.	Survivors with positive spleen cultures.
A	Vaccinated.	50	29	18·3	21	12
	Control.	50	50	5·0	0	—
B	Vaccinated	50 50	27 30	15·6 15·8	23 20	7 12
	Control.	50	49	6.7	1	1

With regard to the natural acquirement of immunity during the course of an epidemic, the results already recorded in a considerable series of experiments have shown quite clearly (*a*) that mice which have survived for 30 days or more during an epidemic prevalence of mouse typhoid are more resistant to infection than unexposed controls; and (*b*) that survivors from an *epidemic have seldom escaped infection,* and are frequently harbouring the causative organism in their tissues; many, but not all of these survivors, show *the presence of agglutinins in their blood.*

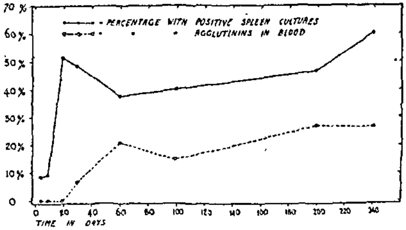
The time relations of these reactions to infection may be illustrated by the results obtained in a small series of tests carried out in collaboration with Prof. Greenwood and others, during a particular epidemic of mouse typhoid. At intervals of four weeks a sample of 20 mice was withdrawn from the cage, so selected as to represent as closely as possible the cage-age constitution of the whole cage population on the day of withdrawal. The cage-age groups into which the population was divided were as follows: 0–5 days, 5–9 days, 10–19 days, 20–29 days, 30–59 days, 60–99 days, 100–199 days, and 200 days or over. In all, 10 samples of 20 mice were withdrawn. These mice were anæsthetised, and bled to the maximum extent. After death their spleens were removed and dropped into tubes of broth. Their serum was tested against three suspensions of *B. aertrycke* for the presence of *agglutinins. In recording the results we may regard* agglutination of any of these suspensions as evidence of an immunising response. As we have already noted mice do not readily form O agglutinins, and our present experience suggests that this holds in infection as well as in artificial immunisation, though we should not wish to dogmatise on this point on the basis of our present scanty data. We have seen, however, that mice which have been inoculated with vaccines containing both flagellar and somatic antigens respond much more readily to the former than to the latter, although their behaviour when exposed to risk of infection indicates that they have made an effective response to the somatic component. Those mice, in an infected herd, which have developed H agglutinins, have certainly received doses of the O antigen; and we may reasonably regard the presence of H antibodies as indicating that some response has been made to the double stimulus.

TABLE V.

Cage-age group in days.	No. in group.	Spleen cultural. Positive.		Agglutinins in serum.		Spleen + Aggl. +	Spleen + Aggl. —	Spleen — Aggl. +
		No.	Per cent.	No.	Per cent.			
0– 4	23	2	8·7	0	0	0	2	0
5– 9	22	2	9·1	0	0	0	2	0
10– 19	39	20	51·3	0	0	0	20	0
20– 29	31	15	48·4	2	6·5	2	13	0
30– 59	24	9	37·5	5	20·8	2	7	3
60– 99	20	8	40·0	3	15·0	3	5	0
100–199	26	12	46·2	7	26·9	4	8	3
200 +	15	9	60·0	4	26·7	3	6	1

The relevant figures are set out in Table V. and Chart 1, and their implications are sufficiently obvious, though the number of mice in any one age-group is small, and the percentages must, therefore, be regarded only as rough approximations. During the first 10 days of life in the cage some 9 per cent. of the mice are found to be infected. This probably measures the risk of infection to which newcomers were exposed *in the particular epidemic in question. Whether these* mice had acquired a fatal infection or were in process of natural immunisation we cannot tell. From the 10th to the 19th day the proportion of infected mice rises sharply to just over 50 per cent. As yet there is no evidence of any immunising response, as evidenced by the production of agglutinins. It is probable, from the statistical results obtained in a large series of mouse typhoid epidemics, that the majority of these mice were fatally infected and would have died in the course of the next few days. From the 20th to the 200th day and beyond the proportion of infected mice does not vary widely. Such fluctuations as occur are well within the

CHART 1.



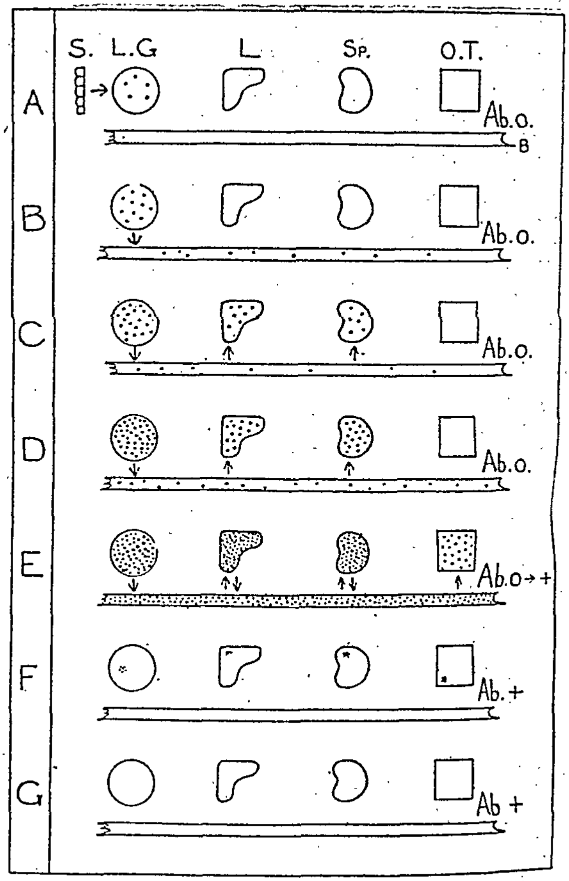
sampling errors inherent in such small groups. Between the 20th and 29th days, however, agglutinins begin to appear, and there is a general upward trend in the proportion of mice showing evidence of antibody production, though it is doubtful whether any real significance can be attached to the variations which occur after the age-group 30–59 days. If these figures are compared with the results which have been recorded in earlier papers by Greenwood, myself, and our colleagues, it will be noted that the appearance of agglutinins about the 30th day corresponds closely with the period at which surviving mice begin to show a significant advantage over new entrants to the cage. It seems clear that, after this length of experience, a proportion of the survivors have acquired a resistance, which is characterised by the persistence of *B. aertrycke* in the tissues, associated with the presence of specific antibodies in the blood.

It will be noted that, even among the mice which have survived for 60 days or more, the majority of the infected animals do not show the presence of antibodies in the circulating blood; of 51 survivors beyond this period 29 yielded positive spleen cultures, but only 10 of these agglutinated *B. aertrycke* at dilutions of 1:20 or over. Any suggestion as to the probable condition of the remaining 10 mice must be merely speculative; but our knowledge as to the general behaviour of mice at this period of residence in the cage renders it unlikely that they were all in the throes of a fatal infection. It must be remembered that these mice, along with all their companions, were exposed to the risk of repeated infection; and it is possible that they had already acquired some degree of resistance as the result of earlier minute doses of bacilli, but had not yet received a stimulus of adequate intensity to produce circulating antibodies in detectable amount. It will be noted, also, that the presence of agglutinins, without the presence of *B. aertrycke* in the spleen, is a relatively rare finding; in only seven of the 200 mice examined was this condition of affairs revealed post mortem. It would appear that complete recovery from infection is a rare event, or, alternatively, that recovery with acquirement of immunity does not prevent reinfection of a type which leads to the fresh deposition of bacteria in the splenic tissues.

The Process of Bacterial Infection.

In may be of interest in this connexion to summarise the probable course of events during an infection with a bacterium of the tissue-invading type. The data on which such a description must be based have been accumulated by many workers during the study of experimental infection with the pneumococcus, the typhoid bacillus, and other organisms, and during the investigation of naturally occurring infections in man. It happens that the particular example of mouse typhoid has recently been submitted to detailed study by Ørskov[30] and his colleagues, with results which are in entire conformity with the picture which emerges from the more general observations. In Fig. 2 I have endeavoured to represent diagrammatically the progress of an infection of this type. At A is represented the initial phase, during which the invading bacteria gain access through a mucous surface, and pass to a regional lymphatic gland. At B the bacteria are proliferating in the gland, and there is an intermittent escape of some of them into the blood stream. At C these are shown as collecting in the liver and spleen, these organs being taken as examples of tissues rich in reticulo-endothelial cells, and hence concerned in the normal clearing mechanism of the blood. At D the bacteria are proliferating in those situations in which they have collected during the initial phases of infection, which correspond to the incubation period of a clinical attack of disease. At E there is a re-invasion of the blood stream from these foci of bacterial proliferation, a well-marked bacteriæmia, and a transport of bacteria to other tissues, not previously infected. This corresponds to the phase of clinical illness, and, in a fatal case, terminates in death. Up to this stage no antibodies have appeared in the circulating blood; but at this point they usually make their appearance in cases which recover. At F is represented the phase of clinical recovery. The improved clearing mechanism, consequent on an efficient antibody-producing response, has terminated the bacteriæmic stage; and we are left with a few scattered foci of infection, in the spleen, liver, and lymph nodes, and perhaps in other tissues. As we have seen, there is reason to believe that the persistence of this state of affairs over prolonged periods is consistent with the maintenance of apparent health. At G is represented the final stage of complete restitution, with the disappearance of all infecting bacteria, and the persistence, in the tissues or body fluids, of protective antibodies. It is, of course, possible, if not probable, that a proportion of infections may be terminated at one of the initial stages, A, B, C or D, without ever passing to E, the stage of clinical illness; and it seems reasonable to suppose that such abortive infections, especially if repeated, may lead to the acquirement of a significant degree of immunity to reinfection. That the immunity so produced is only relative is evidenced by the fact that no period of survival in an epidemic cage ensures a mouse against death from mouse typhoid. Under the conditions obtaining in these cages, almost all mice succumb, in the long run, to the prevalent disease. This fatal infection of partially immunised mice may be due in some cases to the reception of an overwhelming dose of bacteria from without. The fact that mice, which have been artificially immunised with dead bacilli, or have withstood an infection with living organisms, may die after a subsequent intraperitoneal inoculation of a moderate dose of the same

FIG. 2.



S = Mucous surface. L.G. = Regional lymph glands. L. = Liver. Sp. = Spleen. O.T. = Other tissues. B.S. = Blood stream. Ab.O. = Circulating antibodies absent. Ab.+ = Circulating antibodies present.

bacterial strain, shows that such a defence-rupture may readily be accomplished under experimental conditions. It is possible that, in other cases, the survivors succumb, not to fresh infection from without, but to a spread of infection from latent foci, determined by some temporary variation in physiological conditions. The demonstration, by Boycott and Price-Jones,[31] of the effect of fatigue in increasing the mortality-rate among rats infected with *B. enteritidis*, affords one example of the action of such a non-specific factor.

THE VIRULENCE OF BACTERIA IN LATENT FOCI.

Finally, the evidence does not suggest that the bacilli which remain latent in the tissues suffer any loss of virulence. In a series of experiments recently recorded we started several epidemics by inoculating 25 mice with a culture of *B. aertrycke* of known virulence, and adding to these infected mice 100 normal animals. When these epidemics had subsided two to three months later we were left in each case with a certain number of survivors; and from the majority of these *B. aertrycke* was recovered by spleen culture. Several of these recovered strains were tested for virulence by inoculating 30 mice intraperitoneally with 1000 bacilli; in each case the strain so tested was as virulent as that with which the epidemic was commenced. We have recently obtained evidence pointing in the same direction, by testing the virulence of strains recovered from some of the mice included in the samples withdrawn from the epidemic cage. In all, 16 of these strains have been tested, and the results are set out in Table VI., together with the number of days residence in the cage of the mouse from which each strain was recovered. It is obvious that all strains are fully virulent, the small differences in average time to death, and the occasional survival of a single mouse, being well within the limits of error of such a test as this.

TABLE VI.

Strain (from survivor).	From mouse surviving in cage during—	Mice inoculated.	Mice died in 14 days.	Aver. time to death in days.	Strain (from survivor).	From mouse surviving in cage during—	Mice inoculated.	Mice died in 14 days.	Aver. time to death in days.
	Days.					Days.			
A	342	30	29	7·4	J	28	30	30	6·6
B	341	30	30	7·4	K	27	30	30	6·0
C	185	30	30	6·3	L	19	30	30	4·6
D	138	30	30	7·6	M	19	30	29	6·2
E	69	30	30	7·4	N	19	30	29	5·3
F	59	30	30	6·8	O	18	30	29	6·5
G	39	30	30	5·9	P	17	30	28	7·1
H	29	30	29	7·6	Q	4	30	30	5·9

We have also tested the virulence of seven strains recovered from mice which had been vaccinated, and had subsequently survived the inoculation of 1000 virulent bacilli. The results of these tests are set out in Table VII. Clearly, residence within the spleen of an actively immunised mouse for a period of a few weeks does not result in any loss of virulence.

TABLE VII.

Strain (from vaccinated mouse)	Mice inoculated.	Died in 14 days.	Average time to death in days.
A	30	30	5·0
B	30	30	4·1
C	30	30	4·4
D	30	29	6·3
E	30	30	5·2
F	30	30	5·7
G	30	30	5·0

CONCLUSION.

I do not think that there can be any reasonable doubt that the defence mechanism which we have been considering plays an important part in the natural acquirement of immunity; and recent studies on diseases due to filtrable viruses suggest rather strongly, that the same general type of reaction is concerned in acquired resistance to these infections. It is, of course, possible that other factors, of which as yet we know nothing, may be concerned in specifically increasing the resistance of the host to invasive bacteria; but I think a protest may reasonably be entered against the readiness, noticeable in some of the recent contributions to immunological literature, to discard the conception of antigen-antibody reactions as an important factor in the defence mechanism of the host. This mechanism is, I think, as well authenticated as many of those which the physiologist would regard as fundamental to his conception of the working of the animal body; and any attempt to dismiss it as a chimera is to suggest a degree of instability and lack of form in this branch of pathology which does not in fact exist. No one doubts that many other factors, quite different in their action, are involved in resistance to bacterial infection, and some of these may well be of primary importance; but the present indications would suggest that these will be found to be non-specific in their action, or, at least, less narrowly specific than the antigen-antibody reactions which we have been considering.

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ANCOATS HOSPITAL.—The recent centenary appeal for this hospital was for £100,000, but only £32,000 has been collected, and of this £20,000 was promised before the appeal was made. As a consequence only about half of the scheme can be carried out, and at most 50 beds will be added to the hospital, and even to achieve this the hospital will have to withdraw £18,000 from investments, which, with the £32,000 collected, will make £50,000, only one-half of the sum so urgently required.

HEALTH LECTURES IN PRISONS.—The People's League of Health is inaugurating a fresh series of health lectures in prisons and Borstal institutions in London and many parts of the country. Among those already arranged is a series entitled the Laws of Health as Applied to the Person. These are being given in Bedford Prison by Dr. Eric Holmes, Mrs. S. V. T. Adams, and Mr. Leslie Harris, D.Sc. Sir John Collie, M.D., will visit Wormwood Scrubs, taking as his subject the Human Body and Its Functions, and a series is also going on at Pentonville, including addresses by Dr. Tom Jays, Mr. George Thomson, L.D.S., and Dr. G. Orissa Taylor.

NOTES ON THE
X RAY DIAGNOSIS OF MITRAL STENOSIS.

BY HAROLD COOKSON, M.D., B.Sc. BIRM.,
M.R.C.P. LOND.,
CLINICAL ASSISTANT, NATIONAL HOSPITAL FOR DISEASES OF THE HEART; LATE MEDICAL REGISTRAR, MIDDLESEX HOSPITAL.

WHEN the diagnosis of so important a lesion as mitral stenosis is in doubt every method of investigation which has been shown to be of value should be used to lessen that doubt, or, better, to convert it into a certainty. The statistics given below indicate the part that X ray examination may play in attaining this object.

Clinical Criteria.

Differences of opinion are not infrequent at the bedside and in the out-patient clinic as to whether or not mitral stenosis is present in a given case. The reasons for this are manifold. The most certain clinical sign of mitral stenosis is a low-pitched rumbling diastolic murmur heard at or near the apex; in most cases, when normal rhythm is present, the end or presystolic part of this murmur, which coincides with systole of the auricle, is heard as a crescendo which terminates abruptly in the first sound. The impression gained of an increasing volume or crescendo of sound has been shown by phono-electrocardiograms [1] [2] to be an auditory illusion. These records show that the vibrations of the presystolic murmur and of the longer diastolic murmurs are fairly uniform in amplitude and do not show a progressive increase in size. The impression of a crescendo is probably given by the termination of the murmur in a loud sharp first sound. This explanation is supported by the change in character that occurs when the murmur is separated from the first sound as a result of delayed auriculo-ventricular conduction. The murmur under these conditions loses its crescendo quality; this change is noted by Cowan and Ritchie,[3] who, however, explain it in a different way. The mitral diastolic murmur with its intensity and its crescendo (though illusory) is often most conspicuous to the ear, but it has long been recognised as a most fugitive murmur. Present one day, it may have disappeared the next, or have become so faint as to be audible only to those specially skilled in its detection. If the precaution is taken of listening for the murmur in the left lateral position after the patient has undergone some exertion, it may be heard when it would otherwise be missed. But even when the conditions of examination are standardised and the greatest care is used in trying to elicit the murmur, it is found to come and go in a curious way which is not understood, and which is not correlated with any apparent changes in the circulation. This evanescent quality of the mitral diastolic murmur, when there is normal rhythm and no heart failure, constitutes the first difficulty in diagnosing mitral stenosis.

When a coördinated systole of the auricle is absent the diastolic murmur will terminate, unless the heart-rate be rapid and diastole therefore short, before the first sound—that is to say, presystole will be free of murmur. This is the case in auricular fibrillation, and the murmur is then more difficult to recognise. It will be even more elusive if the auricular fibrillation is accompanied by a rapid ventricle, for then diastole and with it the murmur is shortened. If the stenosis is mild it gives rise only to a short murmur in presystole, which coincides with systole of the auricle. As Mackenzie discovered in 1897, if auricular fibrillation has its onset under these conditions, the short murmur disappears and diastole is entirely silent. Considerable left auricular dilatation with thinning of its wall may, however, occur with the persistence of normal rhythm, and under these circumstances the auricular contraction is so weak that it fails to produce the presystolic part of the diastolic murmur. Failing a diastolic apical murmur of the kind described, there are certain equivocal signs on which a diagnosis of mitral stenosis may be based; of these the most important are a slapping apex-beat, a short, sharp first sound, a reduplicated second sound, a reduplicated first sound, and a blowing systolic murmur heard at the apex. Temporary replacement of the presystolic murmur by a reduplicated first sound is sometimes observed in mitral stenosis, and in some cases it may be difficult to distinguish a coarse reduplication from a very short presystolic murmur. It is particularly in nervous individuals and in patients with effort syndrome that the above signs may be met with and lead to a suspicion of mitral stenosis. Cabot's statistics,[4] which show that of 107 necropsied cases of "pure" mitral stenosis the diagnosis was made in life in 48·5 per cent., illustrate the difficulties which have been described.

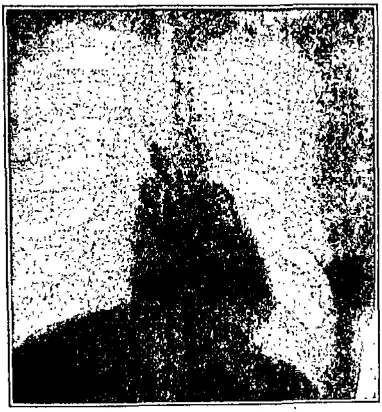
It has been stated above that a low-pitched apical diastolic murmur is the most certain sign of mitral stenosis, but that it is not an absolutely certain sign. Reported cases prove that such a murmur may be heard in the absence of this valvular lesion; it is recorded, for example, in aortic incompetence,[5] with adherent pericardium,[7] and in uræmia.[7] In hyperthyroidism, in addition to a slapping apex and short, sharp first sound, a rumbling bruit may be heard which closely simulates a presystolic murmur.

The X Ray Appearances in Mitral Stenosis.

That the shape of the heart as seen by X rays is often altered in a definite way is now well known. Figs. 1 and 2 show the X ray appearances of a normal heart in the anteroposterior and right anterior oblique (R.A.O.) positions respectively. The R.A.O. position is assumed when the patient faces the X ray screen, and then turns 45° to his left. Comparison with plates taken in corresponding positions in cases of mitral stenosis shows certain differences. Fig. 3, an anteroposterior picture of such a case, shows a prominent slightly convex left middle arc. This is due chiefly to prominence of the pulmonary artery, but partly to an increase in the size of the conus arteriosus and the left auricular appendix; rarely the two structures, pulmonary artery and left auricular appendix, can be discerned as separate prominences, the latter situated just below the former. The projection of the pulmonary artery is brought about by hypertrophy of the right ventricle; this causes the conus and pulmonary artery to be pushed upwards and to the left, and secondly causes a rotation of the whole heart in such a way as to carry the left ventricle posteriorly. Both these changes have the effect of making the pulmonary artery appear more prominently on the left profile of the heart. Frequently there is also an exaggerated convexity of the right border of the heart, due to right auricular and ventricular enlargement; this is shown in Fig. 3. Fig. 4 is an anteroposterior view from a case of mitral stenosis with aortic incompetence. Here the left ventricle is considerably enlarged and this, together with an enlarged left middle arc, results in a straight left border. An inconspicuous aortic knob has been stated to be another result of the rotation of the heart which occurs with right ventricular hypertrophy [6]; this, however, is of small importance, since considerable variation in the size of the knob occurs apart from mitral stenosis.

The right anterior oblique position normally shows a clear area, known as the retrocardiac space, which is bounded in front by the posterior border of the heart and behind by the anterior margin of the vertebral column (Fig. 2). This space is encroached on in mitral stenosis to a greater or lesser extent by the backward dilatation of the left auricle. Fig. 5 illustrates this condition; it shows the retrocardiac space almost entirely filled in. The abnormal shadow is not entirely produced by the left auricle, however; in this case there is, in addition, dilatation of the right auricle. The left auricle is above and the right below; where the two chambers are superimposed, in the middle third of the retrocardiac space, the resulting shadow is much denser. Fig. 6 is taken from another case of mitral stenosis, in the right lateral position, so as to define clearly the posterior border of the bulging auricle. In this position the auricular shadow does not extend as far as the vertebral column. The displacement of the œsophagus, which has been filled with bismuth, as it curves round the posterior surface of the auricle can be clearly seen. The flow of the bismuth has been impeded, as can be seen from the local dilatation of the lumen just above the auricular convexity; the slight constriction of the lumen just above the dilated part corresponds to that portion of the œsophagus crossed by the left bronchus. In a relatively small proportion of cases the enlargement of the left auricle is so great that it forms a part or the whole of the right profile of the heart; several cases of extreme dilatation in which the left auricle almost touches the right chest wall have been published since the first case was recorded in 1901 by Owen and Fenton.

FIG. 1.



Radiogram of normal heart, taken in the anteroposterior position.

Table of X Ray Findings.

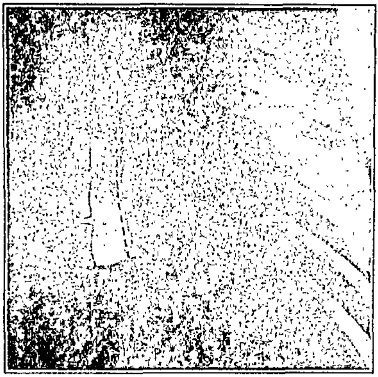
Group.		No. of cases.	Pulmonary artery—		
			Prominent and left auricle enlarged.	Prominent only.	Not prominent and left auricle not enlarged
I.	Cases with apical "mitral" diastolic murmur only.	25	18	3	4
II.	Cases with apical "mitral" diastolic murmur, and basal aortic diastolic murmur.	15	11	4	0
III.	Cases of rheumatic carditis and equivocal signs of mitral stenosis, but no mitral diastolic murmur.	10	6	4	0

Results of Investigation in 50 Cases.

In attempting to assess the diagnostic value of X rays in mitral stenosis the following method was adopted. At first cases in which the diagnosis was practically certain by clinical methods were examined by the X rays, with the object of finding the proportion in which the typical X ray picture occurred. Then a control group of cases of non-rheumatic heart disease was investigated to discover if this typical X ray picture ever occurred, and, if so, with what frequency.

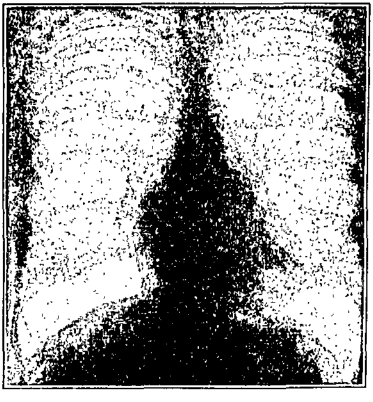
Finally, a group in which the clinical diagnosis of mitral stenosis was probable but not certain was examined in a similar way. The orthodiagraph was used in all cases; it gives an accurate picture of the shape, and, to a lesser extent, of the size of the heart, and is at the same time convenient to use and economical in time and materials. In saying that the clinical diagnosis was practically certain, I mean that at some time, but not necessarily at every time of examination, a rumbling or low-pitched diastolic murmur had been heard at the apex—that is, a diastolic murmur of "mitral" type. These cases have been divided into two groups—those in which there was a "mitral" apical diastolic murmur only (Group I. in Table), and those in which there was in addition the high-pitched murmur of aortic incompetence at the base of the heart (Group II. in Table).

FIG. 2.



Radiogram of normal heart, taken in the right anterior oblique position, showing a clear retrocardiac space.

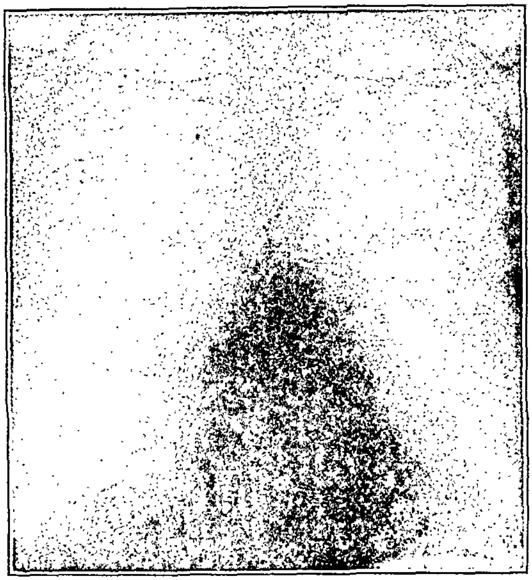
FIG. 3.



Radiogram from a case of mitral stenosis (anteroposterior position).

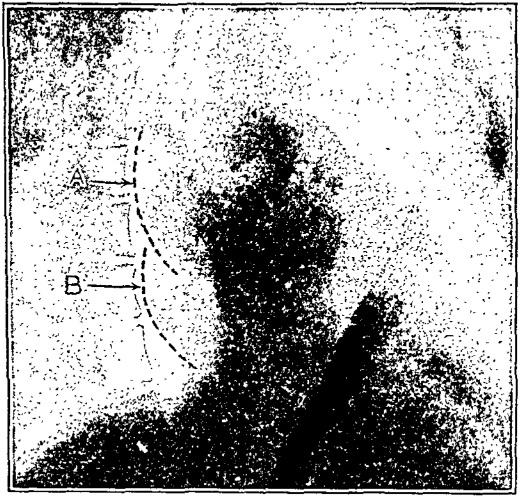
Since there are recorded cases of aortic incompetence in which a presystolic murmur has been heard and in which the mitral valve has been demonstrated to be normal post mortem, there is a possibility that the "mitral" diastolic murmur was of aortic origin in the cases in Group II. The possibility is, however, remote as such a demonstration has been very rarely made. There was no case of adherent pericardium—another condition in which the presystolic murmur has been heard, and yet the mitral valve subsequently shown to be normal. It may be taken, then, as almost certain that mitral stenosis was present in Groups I. and II. It will be seen that out of 40 cases in these two groups 29 (72·5 per cent.) showed a prominent pulmonary artery and an enlarged left auricle; four (10 per cent.) showed neither of these changes; and three (7·5 per cent.) showed a prominent pulmonary artery only. An obvious projection on the left middle arc or a straight left border when the left ventricle is enlarged has been taken as indicating a prominent pulmonary artery. A backward extension of the upper two-thirds of the posterior profile of the heart, so as to touch the anterior margin of the vertebral column at some point, has been used as the criterion of an enlarged left auricle. In two instances two convexities were present on the left middle arc; the upper of these is produced by the pulmonary artery, and the lower by a hypertrophied conus arteriosus, around which an enlarged left auricular appendix may be wrapped. This last condition has been seen recently in two autopsies. In three cases—i.e., 7·5 per cent.—the left auricle projected to the right so far as to form part of the right profile of the heart; auricular fibrillation was present in all three.

FIG. 4.



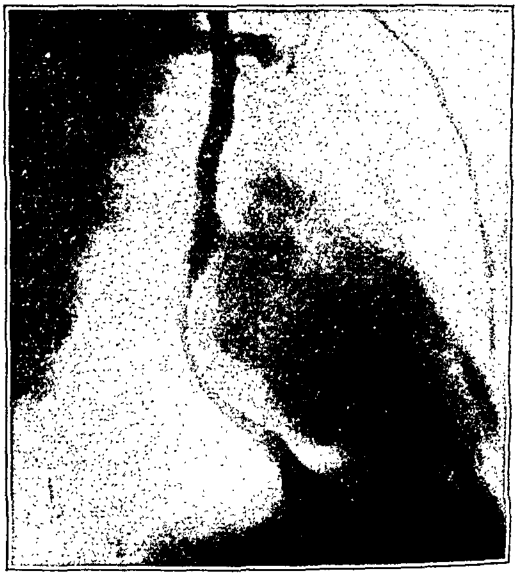
Radiogram of heart with mitral stenosis and aortic incompetence. Note the straight left border produced by exaggeration of the left middle arc together with enlargement of the left ventricle.

FIG. 5.



Radiogram of heart with mitral stenosis, taken in the right anterior oblique position. The retrocardiac space is almost entirely obscured by the shadows of the right and left auricles. (Compare Fig. 2.)

FIG. 6.



Radiogram taken in right anterior oblique position in a case of mitral stenosis. The œsophagus, outlined with barium, curves round the posterior border of the dilated left auricle.

Certain other structures may simulate a prominent pulmonary artery in the anteroposterior position and a dilated left auricle in the oblique position. A visible descending aorta, whether dilated or not, and an enlarged root-shadow may be mistaken for the first, and a rounded mass of glands in the posterior mediastinum for the second. With careful examination, however, it is easy to discriminate between these conditions; the shape, position, and regularity or otherwise of the contour of the shadows are distinctive. The X ray findings are vitiated if there is chest deformity, such as a funnel chest, or any abnormal curvature of the vertebral column. Vaquez and Bordet [8] state that increase in the size of the left auricle can be seen earliest and best in the left anterior oblique and right posterior oblique positions. I have found, however, that the outline of the auricle is shown more clearly in the right anterior oblique position, especially when the left ventricle is enlarged.

The next step was to determine with what frequency this picture, which has been shown to be very common in mitral stenosis, occurred in other conditions, for a prominent pulmonary artery will be met with in any condition which leads to right ventricular hypertrophy; it is very common in congenital heart disease and in Ayerza's syndrome, but these are rare. Enlargement of the left auricle is also known to occur apart from mitral stenosis, a few examples of extreme dilatation having been recorded in association with rheumatic heart disease and mitral incompetence.[9 10 11] It is, however, very rare apart from rheumatic heart disease, and mitral incompetence in chronic rheumatic heart disease is rare apart from stenosis. Thirty unselected control cases of non-rheumatic heart disease, made up of syphilitic cardiovascular disease, hypertension, cardiac enlargement of doubtful origin, atheroma of the aorta, and thyrotoxic heart disease, were X rayed. In one case (3 per cent.) the pulmonary artery was slightly prominent, and in one other there was enlargement of the left auricle only; in no one case was there prominence of the pulmonary artery as well as dilatation of the left auricle. The last group consisted of ten cases of rheumatic heart disease in which a "mitral" diastolic murmur had at no time been heard but in which the equivocal signs of mitral stenosis were present. In every case the pulmonary artery was prominent, and in six the left auricle was dilated (Group III. in Table).

Summary and Conclusions.

In 40 cases of rheumatic heart disease in which mitral stenosis was almost certain from clinical examination the orthodiagraph showed a combination of changes which occur in such a large proportion that it may be termed typical. This combination, consisting of prominence of the pulmonary artery and dilatation of the left auricle, was present in 72·5 per cent. of cases. In a further 7·5 per cent. there was a prominent pulmonary artery only. In 10 per cent. the picture was not typical, as neither of the two usual changes was present. Enlargement of the left auricle without any change in the left middle arc was never seen, although a specimen which I have lately examined would probably have given this picture; the mitral valve was stenosed and the left auricle was much enlarged, extending well to the right behind the right auricle, yet there was no appreciable change in the right ventricle. A control group of 30 cases, which were unselected except that rheumatic heart disease (and with it mitral stenosis) was, as far as possible, excluded, showed the typical picture in no instance, although in one the pulmonary artery was prominent, and in one other the left auricle was dilated. Of ten cases with rheumatic heart disease in which mitral stenosis was considered probable on clinical grounds, the typical picture was present in six and in the remaining four the pulmonary artery was prominent.

The conclusion seems justified that the X ray picture, though not infallible, is of great value in the diagnosis of mitral stenosis. It fails in 10 per cent. of cases where the disease is present, and in a much smaller proportion of cases without mitral stenosis it will show a partially characteristic change in the shape of the heart, but never, so these observations suggest, the typical picture

I am indebted to Dr. G. E. Beaumont and Dr. T. F. Cotton for permission to use their cases; and to Dr. F. G. Nicholas for taking the X ray pictures and some of the orthodiagrams.

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BELFAST HOSPITAL FOR SICK CHILDREN.—The foundation-stone of the new building was laid recently by Mrs. Harold Barbour. The building will contain 60 beds, but the administrative block and offices are designed for a hospital of 100 beds, and there will be an enlargement so soon as means permit.

THE MEDICAL MANAGEMENT OF A CASE OF GASTRIC OR DUODENAL ULCERATION.

BY JOHN H. ANDERSON, C.M.G., C.B.E.,
M.D. MELB.,
PHYSICIAN TO RUTHIN CASTLE, NORTH WALES.

IN days gone by medical measures were employed exclusively in the treatment of gastric ulcer, and though gastric surgery has advanced greatly in recent years, medical treatment has lost nothing of its importance whether or not it is combined with surgery.

Medical treatment can be divided into: (*a*) feeding entirely by the bowel, or (*b*) a graduated diet, with alkalis, by the mouth. The latter practice is the routine adopted at Ruthin Castle. Essentials for medical treatment are: (1) coöperation of the patient, (2) removal of septic foci, (3) rest, (4) diet, (5) alkalis.

Coöperation of the Patient.

When the diagnosis is established the patient is told that his disease may be treated medically or surgically, and unless there is some feature calling for surgery medical measures are advised. It is stipulated that a reasonable time be given for treatment, otherwise it is feared that the result will not be satisfactory to patient or physician. Three months is suggested as the minimum time required, of which the first month is spent in bed, about a month getting up and about, and a third month for a gradual return to active life. For the first two months institutional treatment is to be preferred; for it has been our experience that treatment undertaken at home is not so successful as that carried out under the constant supervision which is possible in a hospital. The diet also calls for a care and precision which it is difficult to organise in a private house.

For example, a man of 37 preferred to carry out treatment at home when he could attend to his work with the help of a telephone by the bedside and daily visits from a stenographer and his works manager. All symptoms ceased, but the anæmia did not improve and X rays two months later showed no change in the gastric lesion, a small prepyloric ulcer.

During his time in bed an attempt is made by daily talks to get the patient to understand the reason for the various points in his routine, with a view to shaping his life after he leaves hospital. Lawrence has ably described the "diabetic life," and we attempt to lay down in these cases what may be called the "ulcer life," pointing out where dangers lie and emphasising the need of careful supervision by his medical attendant, and of a permanent routine after leaving hospital.

Removal of Septic Foci.

If not already done, the body is searched for sources of infection. In this quest mouth, throat, tonsils, nasal sinuses, teeth, bowel, gall-bladder, kidneys, and urinary bladder are systematically gone over and any lesion dealt with as far as possible. The importance of this procedure cannot be stressed too highly. If in this connexion laparotomy is required, the opportunity is, of course, taken to examine the ulcer and carry out any further surgical procedure that seems desirable. We have seen the removal of a septic focus, such as a chronic appendicitis, lead, with medical treatment, to a permanent healing of a gastric ulcer without any deforming or crippling operation on the stomach. Even when the collaboration of a surgeon has been sought, and the case dealt with in the first instance by him, it is felt that when the surgical condition has been relieved, the medical after-treatment should be in the hands of a physician.

Rest.

The whole body is rested by at least four weeks in bed, lying on the back, shoulders flat on the bed, and head raised by one or two small pillows. Daily massage helps to keep up the muscular nutrition and to avoid the cramps and aches which otherwise so often occur, particularly in the first two or three days in bed, and later about the end of the second week. The stomach is rested by frequent small meals as indicated under "diet." Aperients are avoided, and at first an enema is given on alternate days. At a later stage liquid paraffin is added and, as a rule, before the patient is getting up the bowels are acting naturally.

Diet.

In former days fasting or rectal feeding was the routine method. E. I. Spriggs published, in 1907, the first series of cases treated in this country by immediate mouth feeding,[1] and in the following year W. Langdon Brown described 11 cases similarly treated.[2] The present method is a combination of the diet of Lenhartz, and the olive oil of Cohnheim and Walko modified by Dr. Spriggs in the course of 21 years' experience. The régime cannot be applied as it is set forth to every, probably not to any, patient. Each case requires individual care and inquiry with resulting modification of the instructions.

The diet is graduated in 26 steps, starting with olive oil and alkaline water and working up gradually to a light diet. The best idea of it may be given by setting out three or four stages.

Diet on First Day.

(30 c.cm. = one ounce.)

	c.cm.		c.cm.
8 A.M. ..	15 of olive oil.	5 P.M. ..	15 of olive oil.
9 ,, ..	60 of alk. water.	6 ,, ..	60 of alk. water.
11 ,, ..	15 of olive oil.	8 ,, ..	15 of olive oil.
12 noon..	60 of alk.water.	9 ,, ..	60 of alk. water.
2 P.M. ..	15 of olive oil.	10 ,, ..	15 of olive oil.
3 ,, ..	60 of alk. water.		

Food value, 770 cal. approximately. Alk. = alkaline.

A few patients cannot take olive oil at all, and in this case a milk cream mixture is substituted for the oil. This is made by mixing 180 c.cm. of milk, 60 c.cm. of lime water, and 60 c.cm. of cream. The alkaline water is made up of 15 grammes of bicarbonate of soda in one pint of water, and an extra 30 c.cm. is allowed between the olive oil feeds if the patient desires. It has been found possible to start gradually a diet of this nature three or four days after a hæmorrhage.

Diet on Third Day.

This consists of egg and milk mixture three-hourly with a dose of olive oil an hour before each feed.

	c.cm.		c.cm.
8 A.M. ..	30 of olive oil.	5 P.M. ..	30 of olive oil.
9 ,, ..	50 of e.m. mixt.	6 ,, ..	50 c.m. mixt.
11 ,, ..	30 of olive oil.	8 ,, ..	30 of olive oil.
12 noon..	50 of e.m. mixt.	9 ,, ..	50 of e.m. mixt.
2 P.M. ..	30 of olive oil.	10 ,, ..	30 of olive oil.
3 ,, ..	50 of e.m. mixt.		

Food value = 1790 cal. approximately. E.m. mixt. = egg and milk mixture.

The egg and milk mixture consists of one egg in 100 c.cm. of milk, is taken in sips, and if possible is made to last from one dose of olive oil to the next. Alkaline water is provided and sips are taken when required for thirst at intervals of not less than 15 minutes. The olive oil is gradually reduced and the egg and milk mixture increased. On the seventh day boiled rice is added, and on the eighth day minced or pounded chicken.

Diet on Twelfth Day.

Here four meals are given, olive oil before the two chief ones, and extra feeds of egg and milk at 2 P.M. and 9 P.M. 30 g. = one ounce.

Breakfast, 8.30 A.M.—One egg; dry toast (25 g.); butter (10 g.); milk and water (100 c.cm.).
11.30 A.M.—30 c.cm. of olive oil.
Lunch, 12 noon.—Minced or pounded beef (56 g.); dry toast (20 g.); butter (5 g.).
2 P.M.—Egg and milk mixture (150 c.cm.).
Tea, 4 P.M.—Thin bread and butter (20 g.); milk and water (170 c.cm.).
6.30 P.M.—30 c.cm. of olive oil.
Dinner, 7 P.M.—Boiled rice (30 g.); milk and water (100 c.cm.) dry toast (20 g.); butter (5 g.).
9 P.M.—Egg and milk mixture (150 c.cm.).

Food value = 1930 calories approximately.

The alkaline water is still allowed for thirst. The milk and water mixture consists of 55 c.cm. of milk and 35 c.cm. of water. The allowances are increased gradually, as is shown by the diet on the twentieth day.

Diet on Twentieth Day.

Much the same as the preceding, but with more variety.

Breakfast.—Egg or fish; dry toast; butter; milk and water.
11.30 A.M.—30 c.cm. of olive oil.
Lunch.—Chicken; mashed potatoes; dry toast; butter; rice pudding; milk and water.
2 P.M.—Egg and milk mixture.
Tea, 4 P.M.—Dry toast or dried bread and butter; sponge cake; milk.
6.30 P.M.—30 c.cm. of olive oil.
Dinner, 7 P.M.—Steamed fish; toast and butter; macaroni or vermicelli; milk pudding or custard; water or soda water;
10 P.M.—Milk and rusk or Bengers' food.

Food value = 3000 calories approximately.

If pain or discomfort recurs the diet is kept the same for a day or two or is taken back to an early stage, and increased again later.

As the patient gets up, more foods are added, and the diet on leaving is made up as follows:—

Diet on Leaving.

A light ordinary bland diet.

Breakfast.—Porridge, fish, cold fat ham, egg; toast; butter; cream; flavoured milk or weak China tea.
Lunch.—Chicken, mutton, or lamb; potato; sieved greens; milk or light steamed pudding; cream; sieved fruit.
Tea.—Bread and butter; sponge cake; milk and water or weak tea.
Dinner.—Fish, chicken or sweetbread; potato; sieved greens; macaroni or vermicelli, milk pudding, cold sweet, sieved or puréed fruit; toast; butter; cream.

It must be intoned that in all cases variations are necessary to meet personal likes and dislikes and ingenuity is often severely taxed. It is surprising, however, how few failures there are in keeping fairly close to the desired diet if patience, tact, and humanity are displayed in the dealings between doctor and patient. Visiting at meal times is often a great help.

Alkalis.

Various alkalis are used, such as sodium bicarbonate, sodium citrate, cremor magnesiæ, magnesium carbonate or hydroxide, and calcium carbonate. Bismuth oxychloride is generally given three times a day in water as a routine; sodium bicarbonate is in the alkaline water which the patient takes steadily throughout his time in bed, and the other drugs are used from time to time as required. The magnesium compounds are especially useful if constipation is a feature, and the cremor magnesiæ if gastric flatulence is a leading symptom. The well-known combination of the carbonates of bismuth and magnesium and the bicarbonate of soda should be specially recalled. Another useful powder is one made up of equal parts of bismuth oxychloride, sodium citrate, and mag. carb. lev., one teaspoonful as a dose three times a day after meals in water. If there is any looseness of the stools calcium carbonate is substituted for the magnesium carbonate. No case of alkalosis has been seen.

General.

While in bed the mouth is cleaned after each feed, and sleeping helped when required with small doses of medinal or dial ciba. If wakefulness is complained of, a small feed through the night is often more useful than a hypnotic. Smoking is discouraged.

Progress.

Progress, as a rule, is uneventful and is checked by: (*a*) disappearance of symptoms; (*b*) examination of stools for blood, visible and occult; (*c*) radiography of the stomach. The pain gradually eases and, as a rule, is gone by the sixth to seventh day, though intermittent discomfort may be present for a few days longer. If pain is still prominent by the end of the second week, the case is reconsidered in all its bearings with a view to deciding whether medical treatment should be continued or surgery advised. At this time of alleviation of symptoms it is advisable to point out to the patient that his improvement does not mean a cure, but is merely an indication that cure would appear to be possible and even probable. He is told that the "ulcer is skinning over," but that time must be given for the new covering to become several cells thick. Histological work has shown that this process takes a long time; and it cannot be hastened. A useful analogy can be drawn between the healing of the internal ulcer and the gradual scarring of a deep abrasion of the skin. Blood disappears from the fæces at an early stage of healing, and the later progress can be judged from an X ray photograph of the ulcer site. The diet is steadily increased as has been shown, and more latitude of movement in bed allowed, and finally the patient is allowed to get up in a chair and out of doors as weather permits. Walking is carefully graduated, and violent exercise prohibited. He is cautioned that absence of symptoms does not mean that liberties may be taken. Lord Moynihan has stated the position in his aphorism that "clinical silence does not mean pathological inactivity," and this point is emphasised to the patient as clearly and as forcibly as possible. A normal life, with certain limitations, is resumed gradually, and on leaving hospital some simple instructions are given, in addition to the suggested diet as already described.

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[1] Trans. Med.-Chir. Soc., 1907, xc., 283.
[2] Clin. Jour., 1908, 1908-9, xxxiii., 109.

Example of Instructions.

The diet should consist of simple foods, avoiding beef, pork, pastry, vinegar, pickles, twice-cooked foods, and foods containing shreds and hard pieces. Hot fats and raw fruit should be taken sparingly, and all fruit and greens should be passed through a sieve.

For the present rest a full hour in the middle of the day and in the evening. Bed not later than 10 P.M.

Exercise daily in the open air, increasing the time gradually, but not to the point of fatigue.

The return to work should be gradual; at first not more than two hours a day, gradually increasing as strength is regained. Work should be so planned as to avoid long-continued effort or hurry. Enough time must be allowed for meals.

Alcohol is not advised. Smoking is not advised for the present, and when resumed should be limited to the half-hour immediately after a meal.

Continue the liquid paraffin, dose modified as required, and the olive oil before meals. Half a teaspoonful of bicarbonate of soda or of the prescribed powder, in water, should be taken an hour after meals.

The return to full strength will be gradual and no alteration in the régime must be made without medical advice.

Results.

At the outset the problem arises as to what is a cure. For example :—

A man of 20 had a gastro-enterostomy for duodenal ulceration and was free from symptoms till the age of 30. Abdominal trouble returned, and at the age of 48 radiographic examination showed an inflamed area near the pylorus and what was regarded as a small ulcer near by. After medical treatment he was well and worked hard for nearly two years. Gross indiscretions in eating and drinking were then followed by two small hæmorrhages, and he now has an ulcer just beyond the pylorus. In this case it can be said that both surgical and medical treatment have been successful or unsuccessful, according to the view taken of what success in these cases really is. I feel that both were successful with the balance against surgery as the stoma has almost closed. The lack of success lay with the patient in that he did not realise and remain within his limitations, thus returning to his vomit, literally and metaphorically.

The method of treatment here described has been used at Duff House and Ruthin Castle for 15 years, and has yielded good results in cases of gastric and duodenal ulceration in which there is no direct call for surgery.

In cases with much pyloric or duodenal deformity, those in which symptoms persist after a fair trial of medical measures and, above all, those with any suspicion of malignancy, operation is advised, not as a different method, but as an incident in the course of the treatment. In our experience this occurs in about one case in five of gastric ulcer, the other four do well under medical treatment and, as far as can be ascertained, most of them go on well if a reasonable life is followed. In the last 30 cases of gastric ulcer four were advised operation. One died as a result of the operation, one refused operation and died later from a perforation, and the other two benefited from the operation. The exact figures in a series of over 200 cases of duodenal ulcer are not yet available.

The experiences of other workers have been deliberately omitted, but reference may be made to an article by Prof. Charles Pannett.[3] His opinion is that "No ulcer patient should be subjected to operation until medical treatment has proved a failure," and the same view has been expressed by many other leading surgeons. It is our duty as physicians to make the number of medical failures as few as possible.

I am indebted to my senior physician, Dr. E. I. Spriggs, for helpful criticism in preparing this article, and to Dr. Mary Watson for collecting and summarising the cases quoted.

NOTES ON FRACTURED PATELLA.

BY A. P. BERTWISTLE, M.B. LEEDS,
F.R.C.S. EDIN.

FRACTURES of the patella may be classified in two main groups according to their causation and treatment—viz., those due to direct violence, and those caused by muscular action. Whilst all are in agreement about the treatment of the former, that of the latter is by no means standardised. This is all the more surprising, as the patella was the second of all bones to be wired, and this procedure gives as good results as any other of its class. The olecranon was the first bone to be wired, and to Lister, who performed this operation, is also due the credit of wiring the patella, though Cameron preceded him by a year in 1876. In the eyes of his rivals it was Lister's boldest surgical effrontery. P. Turner recently reported a case operated upon by Howse 38 years ago; he probably used the carbolic spray and kept the limb on a back splint for six weeks.[1] At that time Malgaigne's hooks were considered effective, but the pain and irritation they caused led to their abandonment.[2]

Fracture from Direct Violence.

Fractured patella may occur in several members of the same family and re-fracture at the same or a different place is not uncommon. Both these facts suggest a congenital weakness. Bilateral fracture, of which I have seen an example, is not uncommon. Direct violence usually causes a starred fracture by crushing the patella against the femur, though transverse and longitudinal breaks are not unknown. The front of the joint becomes extremely swollen, partly from bruising, and partly from distension of the prepatellar bursa. It is only later that the joint itself becomes distended. Some movement is possible immediately after the accident; effusion prevents it later. The aponeurosis and lateral expansions are not divided, and hold the fragments in position. The fracture may be simple or compound. Lateral plaques are usually found at the upper and outer angle of the bone and are often bilateral, a point of considerable diagnostic importance. I have seen one, and Scudder depicts several.[3] The discovery of these plaques after an accident may present considerable confusion, and the symptoms may be due to injury to them.

(a) Simple Fracture.—All are agreed that it is inadvisable to operate on the starred fracture. The first essential is to reduce or at least arrest the swelling by an elastic bandage or firm bandaging over wool; evaporating lotions are of some service. A moulded back splint or a calliper is applied so that the limb can be elevated to an angle of 45°, to relax the rectus femoris, which is more or less taut when the limb is in line with the body. Massage is applied

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[3] Brit. Med. Jour., 1928, i., 623.

daily to the quadriceps, which otherwise wastes rapidly. No active movement is permitted for three weeks, but passive movement should be recommended, or the clots and effusion organise into strong bands which may require open operation. The patient walks with a calliper which permits slowly increasing range of movement after the third week.

(b) *Compound Fracture.*—Fracture from direct violence may result in a compound fracture with a lacerated or punctured wound; the latter is liable to be overlooked, suppuration being the first indication of it. All compound fractures should be explored under anæsthesia and the wound carefully excised.

The immediate *prognosis* is good, bony union being the rule. There is, however, a liability to arthritic changes, since the joint may have been injured as well as the patella.

Fracture from Muscular Action.

By far the commonest accident is for the patient to have imagined a non-existent step while walking upstairs; he jerks his leg forward and collapses, so that the break occurs with the limb flexed. Lister's cases all occurred whilst the patient was in the act of extending the limb to prevent a fall. Immediately after the accident inspection reveals between the fragments a gap which is well seen in the silhouette-radiogram. Power to extend the leg is almost if not completely lost, though it may be possible to walk by swinging the leg forward and hyper-extending (Cotton). Effusion of blood and synovial fluid cause the joint to be distended earlier and to a greater extent than in the other variety of fracture.

The fracture is usually a clean, transverse one associated with a variable amount of laceration of the lateral expansions; the greater the laceration the wider the separation. A very important feature is that the aponeurosis over the patella tears at a different level from that of the fracture and comes to dip down over one fractured surface; crepitus, if felt, is therefore soft. The gap may be anything from ½ in. to 3 in. The lower fragment is usually tilted, so that its fractured surface is directed anteriorly.

The *differential diagnosis* is from: (1) dislocation; a radiogram clears up any doubt. (2) Ruptured ligamentum patellæ; the ligament is rarely ruptured, but usually evulses a flake of the tibial tuberosity, which is well seen in the radiogram, together with the wide separation of patella from tibia. (3) Torn quadriceps; a rare condition differentiated radiographically.

Treatment.

The knee-joint has the largest area of synovial membrane and the greatest number of vitally important ligaments of any joint in the body. It possesses the largest amount of avascular tissue in the form of cartilage. Its poor bony architecture and its exposed position favour synovitis, which may go on to arthritis; in fact, it is the commonest joint to suffer from these conditions. Draining the joint is fraught with danger to itself if not to life. An ankylosed knee is a most crippling deformity.

Two methods of treatment are in use, the conservative and the operative. Most surgeons would now operate unless the gap is very small, as only after operation can bony union occur. The aseptic surgeon of to-day does not consider that the behaviour of the patella differs from that of any other bone after operation. Pre-Listerian results of operation, especially on long-standing cases, surrounded the patella with an evil reputation which is not yet dissipated.

(a) *Conservative Method.*—From the start the limb is put up in the same position as has been described for the starred fracture. Means are taken to reduce the swelling. Some authorities use two loops of bandage, applied above and below the fracture, to maintain apposition, but these are not satisfactory and may cut the skin. Skudder's figures are probably as good as any, and yet he only secured 66·5 per cent. serviceable limbs in six patients not treated surgically, whereas he had good results in 84·5 per cent. of operations; he does not say why some were operated upon and others not.[4] Sir William de Courcy Wheeler records a perfect result with wide separation.[5] Possibly the poor results are due to failure to elevate the limb during treatment.

(b) *Operative Treatment.*—The after-treatment is very much simpler and saves a considerable amount of time but—what is still more important—operation ensures in bony union in most cases and, even if there is a gap, it is of little functional disadvantage. The objections were the fatalities and complications of pre-aseptic days. The former have almost disappeared; the latter are still with us and may be attributed to:—

1. Faulty preparation of the skin. The whole limb from buttock to toes should be prepared with spirit soap and antiseptics for three days. Fomentations are useful for the rugæ around the knee. At the time of operation there should be no eczema or blisters, since the latter teem with micro-organisms. To operate immediately is risky.

2. Unnecessary trauma. It is frequently observed that a surgeon who cuts and is gentle, yet not overfastidious as regards asepsis, gets results which compare favourably with those of one who tears and is rough, but who is scrupulously aseptic. One of the advantages of operation is the possibility of removing clots, but this must be done with the greatest gentleness with forceps and isotonic saline irrigations and not with gauze, since this tends to damage the cartilage and may cause the entrance of bacteria. A joint is well able to remove clot, as is seen in hæmophiliac effusions. Trauma is very important in dealing with long-standing fractures.

3. Devitalisation of the patella. Erichsen[6] describes some dissections performed by Manning which demonstrated that the vascular arch supplying the patella was torn across the internal condyle. This cutting-off of the blood-supply explains the formation of sequestra in unopened fractures, of which Erichsen cites a case.[7] Still more important is its bearing on cases where these form after operation. This devascularisation makes the patella an easy prey to sepsis.

Steps in the Operation.

1. *Time of operation.*—Probably the fourth is the ideal day; the first should be devoted to reduction of swelling.

2. Application of a *tourniquet.*—This useful measure is sometimes omitted. If any vessels are seen they can be ligatured; a firm dressing suffices to arrest capillary and venous hæmorrhage.

3. *Flaps.*—These are horse-shoe shaped; if they are turned up their vitality may be better secured, but if they are turned down the resulting scar is outside the pressure-bearing area of the knee.

4. After raising the flaps it is imperative to *change gloves* or, better, to remove the outer of two pairs worn at the start.

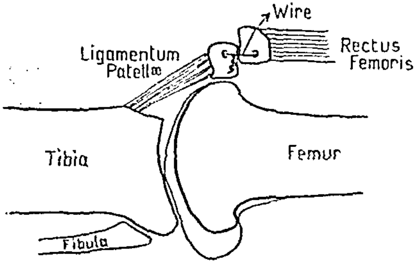
5. *Tetra-cloths* must be arranged to prevent skin contamination.

6. The field must be cleared of *blood-clot* and as much as possible removed from the joint with forceps and saline irrigation. Tags of tissue which are of no use for suture are removed.

7. *Wiring.*—The number of methods in use is legion, suggesting that the ideal is yet to be sought, but Hey Groves's original method fulfils all that is necessary. Two wires are passed transversely and the ends twisted. If trouble arises later, all that is required is an incision over each twist, cutting the twist on one side and removing the rest of the wire. Surgeons generally advise that, if the lower fragment is too small, the wire should be passed through the ligamentum patellæ, and this was actually found necessary in one of Lister's cases. It is in any case much better to introduce one wire through the ligament or rectus expansion, for this makes it much easier to correct any angulation without re-drilling. This tissue, moreover, resents a foreign body far less than such a vital structure as bone. (See figure.) A suture passing into the joint was once used, but no joint will stand such an insult.

8. *Elevation of the limb.*—This is a most useful manœuvre at the time of twisting the wire and one which, in a recent case at the Wembley Hospital, obliterated a gap of 1 in. with ease.

9. *Suture of periosteum* over the patella.—Some surgeons, including Sir Robert Jones, rely entirely on suture of the periosteum and lateral expansions, but the omission of wiring precludes early movement.



10. *Suture of the lateral expansions and tear in the capsule.*—This is of the greatest importance.

11. *Suture of the skin.*

12. A firm, bulky *dressing* arrests hæmorrhage and effusion and restrains movement. Some surgeons use a back-splint until the patient is round from the anæsthetic.

13. *Removal of the tourniquet.*

After-treatment.

On the third day a less bulky dressing is applied and massage to the quadriceps is commenced. All dressings are removed between the seventh and tenth days, when the wound should be healed. The patella may with advantage be moved on the femur to prevent adhesions. The patient is allowed to walk with a stick after two or three weeks and should be able to resume his former occupation in three months.

It was observed during the late war that fractures united more quickly in the south of France, where it was warm, than in the north. Recently I have tried radiant heat for fractures; the patients were pleased and one case, where union had been delayed, united rapidly under heat.

Wire v. *absorbable suture.*—This is a very controversial subject. Wire permits early movement, which most surgeons consider advisable, though some, including Sir Robert Jones, keep a fractured patella six weeks on a back splint. Against the advantage of strength is the fact that wire is not well tolerated by some patients and may have to be removed or it may break months after insertion. Kangaroo tendon is good but scarce. Autogenous grafts, first used by Golding Bird, are awkward to use and lengthen the time of operation. Stout catgut possesses little tensile strength after a week.

Old Fractures.

To quote Lord Lister, "the ununited case is in every respect worse as a subject for treatment than the recent one." [8] It is these cases which account for many of the failures of operative treatment. It is imperative to freshen the ends by sawing off a flake of bone, so introducing the all-important element of trauma. In addition to lengthening of the ligaments, there is often marked wasting and contracture of the quadriceps. The contracture may be so marked that the operation has to be performed in two stages, the first aiming at reducing the separation as much as possible with the limb elevated, subsequently allowing it to be lowered for a week or so. The second consists of making apposition. In severe cases the rectus femoris or even the quadriceps may need incisions to lengthen them.[9] Extreme old age, debility, and infective conditions are the only strong contra-indications. Spinal or regional anæsthesia can be used where necessary. The outlook for diabetics has been completely changed since the advent of insulin and a properly controlled diet.

Summary.

1. Starred fractures should be treated on conservative lines, elevating the limb to an angle of 45°.

2. Transverse fractures with separation are best treated by operation.

3. Complications and deaths after operation are due to sepsis caused by (*a*) faulty preparation of the skin, and (*b*) unnecessary trauma. They are predisposed to by devascularisation of the patella.

4. Hey Groves's method of using two transverse wires is the ideal one.

5. Elevation of the limb at the time of securing the twist is most helpful.

6. Old fractures account for most of the poor results.

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THE LÆVULOSE TOLERANCE TEST
FOR HEPATIC EFFICIENCY IN PATIENTS WITH EPILEPSY.

BY MINNIE GOSDEN, M.B. LOND.,
ASSISTANT MEDICAL OFFICER, LINGFIELD EPILEPTIC COLONY, SURREY;

AND

J. TYLOR FOX, M.D. CAMB., D.P.M.
MEDICAL SUPERINTENDENT OF THE COLONY.

IN 1916 Thom [1] pointed out that the ratio of brain to liver weight in patients who had had epileptic fits was greater than in normal persons. It is well known that degenerative changes are found in the liver in patients dying in status epilepticus. Lennox and Cobb,[2] in an extensive review of the literature on epilepsy up to 1927, state that although the liver has been thought to be at fault in these patients, they had not found any results of tests for hepatic function published.

In view of these findings the following results of the lævulose tolerance test in 16 patients with epilepsy and in three medical cases with no history of fits are thought to be worth recording.

The technique used has been to take a sample of blood, usually in the morning, with the patient fasting from the previous evening in order to estimate the fasting level of sugar in the blood, then to administer 45 g. of lævulose dissolved in 100 c.cm. of water by mouth, and collect samples of blood at half-hourly intervals for two hours, and estimate the blood-sugar in each of the samples. The method of blood-sugar estimation used has been that of Folin and Wu [3] using 1 c.cm. of blood obtained by venepuncture for each estimation.

The result of administering lævulose by mouth in normal people has been found to be a very slight rise in the amount of sugar in the blood. In cases where the function of the liver is deficient a higher and more prolonged rise occurs. This result has been found by several different workers, who, using different methods of blood-sugar estimation, have obtained very consistent results. In 1913 Schirokauer [4] found that administration of lævulose by mouth caused little or no rise in the blood-sugar level in a normal person, but that a definite rise occurred in cases of hepatic disease. This was confirmed by MacLean and de Wesselow [5] in their work on tolerance to various carbohydrates. They found that lævulose was the only carbohydrate which caused only a slight rise, averaging about 8 mg. per 100 c.cm. in the level of sugar in the blood. Spence and Brett,[6] in 1921, found it a useful test for hepatic efficiency. Working on cases of salvarsan poisoning, they found that the amount of the rise and the delay in return to the fasting blood-sugar level were proportional to the amount of liver damage present. (In normal subjects the fasting level is reached within two hours.) In five normal cases they found a maximum rise of 12 mg. and a minimum of 2 mg. per 100 c.cm. of blood. Covell[7] confirmed these results in cases of hepatic disease of many kinds, and it is interesting to note that in his series of medical cases without known liver disease was one case with a history of epilepsy who gave a result indicating some degree of liver deficiency. Tallerman,[8] Finkelstein and Dannenberg,[9] and King[10] have all found similar results both in normal people and in cases of hepatic disease.

TABLE OF RESULTS.

No.	Age and sex.	Fasting % blood-sugar.	Blood-sugar after 45 g. of lævulose.				Rise in mg. per 100 c.cm.	Result.
			½ hr. after.	1 hr. after.	1½ hrs. after.	2 hrs. after.		
1	13 M.	0·094	0·123	0·148	0·142	0·117	54	Marked rise and delayed return to fasting level.
2	36 M.	0·063	0·106	0·126	0·091	0·063	63	High rise.
3	15 F.	0·095	0·128	0·157	0·123	0·119	62	Very marked rise and delayed return.
4	15 F.	0·084	0·094	0·101	0·097	0·092	17	Normal rise, some delay in return.
5	12 M.	0·093	0·107	0·114	0·102	0·093	21	Rise slightly higher than normal.
6	16 M.	0·075	0·100	0·091	0·084	0·086	25	Slightly abnormal rise and delayed return.
7	16 M.	0·084	0·091	0·095	0·091	0·086	11	Normal result.
8	14 M.	0·094	0·105	0·105	0·095	0·092	11	,, ,,
9	14 F.	0·074	0·084	0·097	0·084	0·074	23	Slightly abnormal rise.
9A	14 F.	0·076	0·078	0·078	0·084	0·086	10	Slight and gradual rise.
10	12 M.	0·077	0·105	0·140	0·146	0·129	69	Very marked rise and no return to fasting level in two hours.
1	12 M.	0·097	0·080	0·083	0·083	0·083	Nil	No rise. (It is doubtful if this boy was really fasting.)
12	24 M.	0·072	0·102	0·087	0·078	0·073	30	Rise moderately high.
13	25 M.	0·076	0·079	0·081	0·080	0·082	6	Very slight rise.
14	28 M.	0·092	0·110	0·091	0·090	0·084	18	Normal result.
15	31 M.	0·068	0·080	0·068	0·068	0·068	12	,, ,,
16	42 M.	0·077	0·084	0·078	Lost	0·078	7	,, ,,
17	26 M.	0·064	0·090	0·074	,,	0·064	26	Slightly high rise.
							Control Cases.	
18	26 M.	0·072	0·073	0·072	—	0·072	1	Normal result.
19	66 M.	0·087	0·117	0·111	—	0·095	30	Marked rise and delay in return to normal.
20	20 F.	0·077	0·077	0·081	—	0·077	4	Normal result.

From the finding of all these workers it appears that in the normal individual the result of administering a dose of lævulose by mouth is to cause a temporary rise in the blood-sugar level of at most 18 mg. in 100 c.cm. of blood. The average rise is much lower, being about 8 mg., and the fasting level is regained by the end of two hours. In cases of hepatic disease, whether toxic, inflammatory, neoplastic, or degenerative, the rise is considerably higher and more prolonged, so that the fasting level is not regained in two hours.

It has been found that the test is simple and safe, but there are some difficulties in applying it to epileptics, the chief being that it is only possible to administer the lævulose when the patient is sufficiently conscious to drink, so that, although results have been obtained in cases of severe serial epilepsy, it has not been possible to apply it while status epilepticus was in progress. There was a tendency in several of the patients to vomit after fits and in some cases the lævulose was wasted in this way. The epileptic patients investigated were all living an outdoor life at Lingfield Colony at school or work, and clinically had no abnormalities except those associated with their epilepsy.

The results obtained are expressed in tabular form.

CASE 1.—Male, aged 13. During a severe series of major fits. Two occurred during two hours of test, 29 during previous 24 hours. (Series ended three hours after completion of test.) General history: Physically hypotonic. Tremors. Some stigmata. Intelligence nearly normal, but conduct very abnormal, especially when fit-incidence is high. First fit aged 8. Large number of attacks, mostly major in type, occurring very irregularly.

CASE 2.—Male, aged 36. During frequent series myoclonic attacks occurring every 3–4 seconds, commencing two and a half hours before and ending in a major fit half an hour after commencement of test. General history: Family history unknown; mentally dull. Temperament difficult. Physical condition fairly good. Some stigmata of degeneration. First fit date unknown. Liable to major fits at the rate of three a year and to periods of myoclonus about twice a month. The myoclonus is generalised and very severe, and recurs at intervals for a few hours, occasionally culminating in a major fit.

CASE 3.—Female, aged 15. Following eight major fits in preceding 12 hours. Mentally confused during this morning. General history: Physically poorly developed; frail. Low grade, feeble-minded, and very abnormal mentally. First fit aged 12 months. Frequent major attacks often recurring in groups of eight or ten, accompanied by grave mental confusion.

CASE 4.—Female, aged 15. Following period of freedom from fits. Last fit three weeks earlier, next one hour after end of test. General history: Same as Case 3.

CASE 5.—Male, aged 12. Following five major fits during previous 12 hours. One fit during test, next fit one month later. General history: Physically and mentally normal in spite of frequent fits. First fit aged 11 months, ascribed to fall on the head two months previously. Major attacks occur in groups from one to eight about once a month.

CASE 6.—Male, aged 16. Following one major fit three hours previously. General history: Mentally retarded and deteriorating. Physically poor circulation, and some stigmata of degeneration. First fit aged 4, ascribed to encephalitis following measles. Major fits in large numbers, often in series.

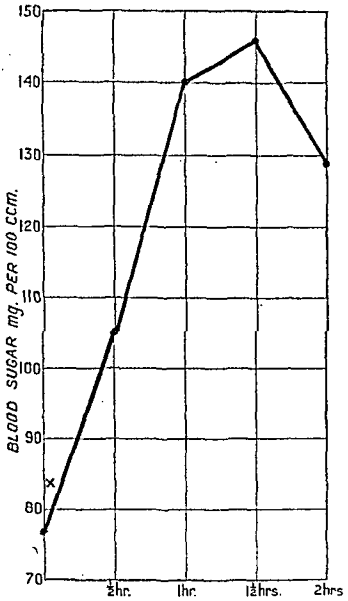
CASE 7.—Male, aged 16. During momentary attacks of slight petit mal, repeated every few seconds. General history: Father had convulsions during teething and mother's mother died of asthma. Mentally and physically normal. First fit, aged 7, ascribed to measles. Major attacks average two a month. Also very large numbers of slight attacks, consisting of jerking head and eyes to right and lasting two to three seconds. (They were diagnosed at one time as a right sterno-mastoid tic.) Luminal partly controls the majors, but neither it nor any other drug influences the minor attacks. Occasionally free from attacks for a day or two, but more often they occur almost continuously for some hours.

CASE 8.—Male, aged 14. During momentary attacks of petit mal, occurring every few seconds, and ending after first hour of test. General history: Family history clear. Physically and mentally normal (many scars due to falling in attacks). First fit aged 7. Very frequent short attacks with loss of consciousness, often falls, rapid return to consciousness. May have a day or two free from attacks; on other days attacks are practically continuous. Bromide and luminal medication useless. ? A case of pyknolepsy.

CASE 9.—Female, aged 14. During long attack of serial epilepsy commencing six weeks earlier. Fits occurring at an average rate of one every 30 minutes by day and night. General condition little affected. General history: Physical condition good. Mentally a little subnormal. First fit aged 12 months. Second attack a few years later. During 1928 isolated major fits every two or three weeks, gradually becoming more frequent until the beginning of December, when they averaged 20 a day and are still (Feb. 1st, 1929) continuing at about the same rate.

CASE 9A.—Female, aged 14. Another morning during this series (Case 9). Patient vomited at intervals during this test, and it is doubtful if much lævulose was absorbed. The estimates were continued for three hours, but fasting level had not been regained. General history: Same as Case 9.

FIG. 1.



CASE 10.—Very marked rise and no return to fasting level. At × 45 g. of lævulose was given by mouth.

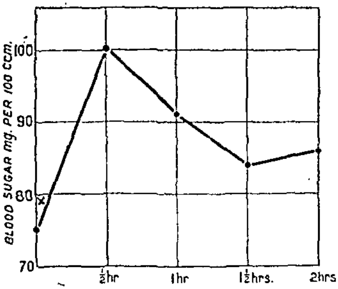
CASE 10.—Male, aged 12. During severe and serious series of fits commencing seven hours previously. Fits occurred every three minutes during test with sufficient return of consciousness to drink lævulose. At commencement of test temperature was 101·4° F., pulse 136, and condition becoming serious. General history: Father's mother insane. High grade, feeble-minded. Difficult temperament. Deteriorating mentally and physically. Poor circulation. First fit aged 4. Since admission to Lingfield two years ago has twice had a clear period lasting four months, and twice had prolonged and very severe series of attacks, one in March–May, 1928, and once in December, 1928. A third such series is likely to prove fatal.

CASE 11.—Male, aged 12. Following two major fits during previous 12 hours, last being five hours previously. No fit during test, none during next month. General history: Brother epileptic imbecile. Mentally feeble-minded and deteriorating. Physical condition fair. First fit aged 9. Liable to series of about a dozen major fits once a month and occasional isolated attacks.

CASE 12.—Male, aged 24. During interval between fits. Last fit 48 hours previously, none for five days later. General history: Physically frail and deteriorating. Mentally feeble-minded and deteriorating. Difficult temperament. First fit aged 4 months. Subject to very frequent major and "automatic" fits, and to occasional attacks of status epilepticus. A very severe case of epilepsy.

CASE 13.—Male, aged 25. Last fit one year previously. Fits have ceased without any drug treatment. General history: Severe head moulding at birth. Some asymmetry of chest. Left-handed. Mentally normal, physically frail. First fit aged 14. Frequent major fits persisted for six years. Recurred a year later in smaller numbers. Last fit recorded September, 1927.

FIG. 2.



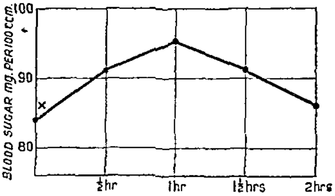
CASE 6.—Slightly abnormal rise and delayed return.

CASE 14.—Male, aged 28. During interval between fits. Last fit three weeks previously. Few myoclonic attacks five days previously. General history: Physically and mentally normal. First fit aged 15, following a fractured skull (large irregular depression of bone in right fronto-parietal region). Now has about one major fit a month.

CASE 15.—Male, aged 31. During interval between fits. One during preceding 12 hours, next two days later. General history: Father committed suicide. Feeble-minded and deteriorating. Physically frail and deteriorating. First fit aged 12. Now major fits at the rate of eight a month. Occasional petit mal.

CASE 16.—Male, aged 42. During interval between fits. Last fit seven days previously. Two slight myoclonic attacks during first half hour of test. General history. Physically frail and deteriorating. Mentally low grade, feeble-minded, and deteriorating. First fit aged 5. Slight myoclonic attacks every morning. A major fit every year or two.

FIG. 3.



CASE 7.—Normal curve.

CASE 17.—Male, aged 20. During interval between fits. General history: Sister died from convulsions. Physically robust. Some stigmata of degeneration. Mentally a little below normal. First fit aged 11. Major fits two or three times a month. Petit mal irregularly

Control Cases.

CASE 18.—Male, aged 26. Case of bronchitis and asthma. No history of epilepsy.

CASE 19.—Male, aged 66. Case of amyotrophic lateral sclerosis. No history of epilepsy. A wasted and ill man.

CASE 20.—Female, aged 20. Abdominal pain, with nil found wrong. Probably a normal person.

In considering these results it will be seen that the cases fall into three groups.

1. Cases with a response typical of severe liver derangement (Nos. 1, 2, 3, and 10)—viz., a very marked rise in blood-sugar and a delayed return to the fasting level, of which an example is given in Fig. 1. These were all patients with severe epilepsy on whom the test was performed during or immediately after numerous fits.

2. Cases with a rise higher than the usual maximum normal (*i.e.*, 18 mg.), but not such a marked rise as group 1, indicating a slight degree of liver deficiency of which an example is given in Fig. 2. Of these cases one (No. 5) was a boy who had a single major fit during the test, and who has little ill-effects from his fits. Another (No. 9) was a girl having repeated fits whose condition remained good in spite of the number of fits occurring. The other result from this patient (No. 9A) was obtained when she was more affected by the fits, and shows a slow gradual rise in level. Vomiting on this morning probably prevented the absorption of much lævulose. The other patients in this group were investigated when they were having intervals free from fits. They were all cases of long-standing epilepsy with some degree of resulting deterioration.

3. Cases giving normal results (Nos. 7, 8, 13, 14, and 16), of which an example is given in Fig. 3. These include two cases of petit mal (Nos. 7 and 8), one man who had been free from any fit for more than a year, one case of traumatic epilepsy, and one old-standing and deteriorating epileptic. Of the three non-epileptic patients (Nos. 18, 19, and 20) two gave normal results and one a result indicating some liver deficiency the cause for which is obscure.

These results appear to indicate that there is a definite liver deficiency in epilepsy, which during severe fits is very marked, and which in old-standing cases persists in a slighter degree in the interval between fits. This agrees with post-mortem findings in cases of epilepsy.

It is realised that this investigation is far from complete and that it needs controlling by other tests for hepatic functions in epilepsy and by more control tests on non-epileptic patients, but in view of the fact that the test for lævulose tolerance has given very constant results with many workers, and as one of the authors has gone abroad and cannot continue the investigation, it has been thought worth recording these findings as showing a defect in liver function in epilepsy which needs further study.

These results form part of an investigation on epilepsy at Lingfield Epileptic Colony, the expenses of which have been met by a grant from research funds of the London Hospital, and the writers wish to express their thanks to the Trustees of the Epilepsy Research Fund and to Dr. Russell Brain and Mr. H. D. Kay, Ph.D., for their help and suggestions, and to Dr. Brain for permission to investigate the three non-epileptic patients at the London Hospital.

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Clinical and Laboratory Notes.

"IDIOPATHIC" HYPERTROPHY OF THE HEART IN A YOUNG MAN.

BY C. H. WHITTLE, M.D. CAMB., M.R.C.P. LOND.,
CLINICAL PATHOLOGIST TO ADDENBROOKE'S HOSPITAL, CAMBRIDGE.

THE number of cases of sudden death to which no cause can be assigned must be greater than is generally suspected. How incomplete is our knowledge of pathology the following account bears witness:—

A student, aged 20, apparently in good health, was seen in the act of falling off his bicycle when cycling home from a lecture, and was picked up in a dazed condition, breathless and blue. He died before he could be got to hospital, five minutes' journey away.

Post-mortem Examination.

He was broad-shouldered, normally developed for his years, with dark hair, pale complexion, and height about 5 ft. 9 in. Hypostatic lividity was marked. The external genitalia were normal.

The thorax contained an enormous heart, weighing 28 oz. The organ was excessively hypertrophied, especially the left ventricle, and the right ventricle was greatly dilated and distended with dark blood. The great veins were similarly engorged. The tricuspid valve ring admitted four fingers easily, and the mitral three. The aortic ring was dilated, but apart from the dilatation the cusps of all four valves appeared normal. Nothing abnormal was found in the coronary arteries or their openings, and the heart muscle though pale was firm. The endocardium was normal.

The aorta was of rather small calibre and the wall thinner and more delicate than usual. At the commencement of the descending part it measured 16 mm. diameter; at the diaphragm 13 mm.; at the bifurcation 8 mm. (The normal measurements at the first two planes are given in Cunningham's *text-book of anatomy* as 23 mm. and 21 mm. respectively.) There were flecks of what appeared to be early atheroma near its origin. There was no congenital abnormality of the cardiac septa or the great vessels.

The trachea and upper part of the bronchi were acutely inflamed, with muco-pus on the mucosa. The tracheal and bronchial lymphatic glands were enlarged and dark purple in colour. The lungs were deeply congested and weighed 16 oz. and 14 oz., right and left respectively.

The thymus was readily found. It weighed 30 grammes. The abdomen and abdominal viscera appeared normal except for venous congestion. The liver weighed 67 oz., the spleen 7½ oz., the right kidney 5 oz., the left kidney 5 oz. The renal capsules were stripped easily and a clean, smooth surface was left. There was no gross abnormality in the suprarenal capsules.

The cranial cavity and brain were normal in appearance; and all visible arteries were good.

The cause of the cardiac dilatation and failure therefore remained obscure, nor was there any reason apparent for the enormous size of the heart.

Morbid Histology.

Microscopic sections of the heart muscle (left ventricle), however, showed considerable swelling and loss of regular striation of the fibres, indicating cloudy swelling. There was no sign of fatty degeneration or infiltration, nor were there any foci of necrosis or inflammation found. The aorta showed small areas of fatty deposits along Henle's membrane, both in the media and in the intima. There was also occasional slight thickening of the intima. Apart from these the wall, though a little thinner than usual, appeared healthy.

The thymus presented a well-nourished cortex and medulla, without sign of atrophy. Hassall's corpuscles were prominent and were calcareous. The liver was a little congested and its sublobular veins distended. There was some finely divided fat in the cells at the centre of the lobule and the Kupfer cells were frequently filled with fat in coarse droplets. Otherwise the liver was normal in appearance. The kidney showed some venous congestion, but was otherwise normal in all respects. There was no sign of vascular changes. The arteries of all sizes in the various viscera appeared perfectly healthy.

Discussion.

The history of the patient revealed little. He had been healthy and normal all his life as far as could be ascertained, and there was no evidence of any illness or indisposition preceding death. He had done much cycling over fairly long distances but no racing.

Apart from the enormous heart, the small, delicate aorta, and the large thymus, the only noteworthy feature of the case was the acute tracheitis, of which unfortunately no cultures were taken. I am indebted to Dr. J. F. Gaskell for the suggestion that tracheitis is most commonly due to influenzal or post-influenzal infection (also see Horder [1]), and that an attack of influenza occurring a few days before death might have been responsible both for the inflammation in the trachea and for the cloudy swelling of the myocardium. There is some evidence that influenza exerts a toxic action on the heart muscle (Horder [2]), and such an explanation would account for the sudden cardiac dilatation. A slight attack might easily be disregarded by a young man, and in the absence of severe muscular exertion it affords the most likely clue to the immediate cause of death.

Some hesitation is felt in stressing the size of the thymus because of the recent tendency to recognise greater variations than heretofore in the normal limits in size of this organ—e.g., Greenwood and Woods.[3] Nevertheless the finding of a thymus weighing 30 g. in a man of 20 years is, I believe, comparatively uncommon.

The great size of the heart remains entirely without explanation. There was no evidence of renal and very little evidence of arterial disease. Several cases of "idiopathic" hypertrophy of the heart have been recorded—e.g., by Howland [4] in 1919—but no light is shed thereby on the pathology of the condition. Unexplained cases of congenital hypoplasia of the aorta have also been noted by Abbott[5] and others. The case under review was carefully searched for any evidence of the changes in small arterioles described by Jores and Prym,[6] Aschoff, Gaskell,[7] and others, but such changes were conspicuous by their absence. The literature affords no indication of the true nature of the condition.

I think, however, that this case is instructive in so far as it bears witness to the fact, recognised by Allbutt,[8] that great enlargement of the heart, possibly accompanied by high blood pressure, may be attained in the entire absence of renal disease, either vascular or parenchymatous. I suggest that the prolonged muscular exertion of cycling may have been an important factor in the case in inducing the remarkable cardiac hypertrophy described.[9]

I wish to thank Dr. J. F. Gaskell for help in the histology of the case.

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THE TREATMENT OF BLACKWATER FEVER BY ORAL SODIUM BICARBONATE.

By CLEMENT C. CHESTERMAN, O.B.E., M.D., M.R.C.P. LOND.,

HOSPITAL OF THE BAPTIST MISSIONARY SOCIETY, YAKUSU, HAUT CONGO BELGE.

IN view of the successful treatment of blackwater fever by intravenous sodium bicarbonate recently reported,[1] the following case is of interest in that the patient's second attack of blackwater fever, and a relapse following it, both yielded within 24 hours to large oral doses of sodium bicarbonate, whereas his first attack 13 months previously, treated by other methods, was of a very serious and prolonged nature.

The patient, a man aged 23, was employed on a rubber and coffee plantation. In June, 1927, he arrived in the Congo. He was very irregular in taking quinine and had occasional malarial fever. In February, 1928, he had his first attack of blackwater fever, being admitted to hospital on the second day with oliguria and exhaustion. Hæmoglobinuria continued for a week, and the treatment was by intravenous glucose, rectal salines, cupping to loins, hot baths, &c.

The present attack began on March 17th, 1929, when he was feverish and bilious and took two doses of 0·5 g. quinine hydrochloride in capsules. On the following day, in spite of fever, he went to work at dawn until he noticed that his urine was dark red. He was transported on an improvised stretcher to the river side and reached hospital in a steamer five hours later. On admission his temperature was 39·7° C. and his pulse-rate 98. He twice vomited brownish bile-stained gastric juice and had one dark liquid motion. The spleen was just palpable.

Treatment was confined to the administration of as much natural lemonade, Vichy water, and tea without milk, as could be taken, 1 to 3 g. of sodium bicarbonate and as much powdered glucose being added to most of the feeds. The course of the illness was as follows:—

1st day: 11 A.M. to 6 P.M. Sod. bic. 10 g., glucose 10 g. in 1000 c.cm. fluids. Urine: 320 c.cm., acid, very dark red with thick brown deposit. Hæmoglobin + + +. Night: Sod. bic. 5 g. in 750 c.cm. fluids. Urine: 700 c.cm., acid, not so dark. Hb + +.

2nd day: 6 A.M. to noon. Sod. bic. 6 g., glucose 10 g. in 750 c.cm. fluids. Urine: 510 c.cm., alkaline, brown colour. Hb + +. Noon to 6 P.M. Sod. bic. 6 g. in 750 c.cm. fluids. Urine: 250 c.cm., alkaline, light brown. Hb trace.

3rd day: Copious clear yellow urine, no albumin. No drugs.

4th day: Two 0·07 g. doses quinine, sod. bic. 10 g. Urine alkaline.

5th day: Two 0·15 g. doses quinine, sod. bic. 10 g. Urine alkaline.

6th day: Four 0·15 g. doses quinine, no sod. bic. Urine alkaline and Tanret's reaction for quinine positive.

7th day: Four 0·30 g. doses quinine. Temp. 38·8° C. No parasites detected in blood.

8th day: Four 0·30 g. doses quinine. Urine acid.

9th day: Four 0·30 g. doses quinine. Temp. normal.

10th day: Two 0·60 g. doses quinine. Felt cold and shivered. Night: Relapse of hæmoglobinuria with 250 c.cm. dark red acid urine. Hb + + +.

11th day: 6 A.M. to noon. Sod. bic. 6 g. Urine: 770 c.cm., slightly lighter. Hb + +. Noon: Rigor. Noon to 6 P.M.: Sod. bic. 8 g. Urine: 800 c.cm., alkaline light red colour, soapy froth, effervescing with acids. Night: Urine, 1200 c.cm., alkaline light red colour.

12th day: 6 A.M. to noon. Sod. bic. 6 g. Urine: 500 c.cm., very light red and strongly alkaline. Hb trace. Noon to 6 P.M.: Sod. bic. 3 g. Urine: 950 c.cm., normal colour. No Hb.

13th and 14th days: Sod. bic. 10 g. Urine copious and normal.

15th to 22nd days: Quinine gradually increased from 0·1 g. to 0·2 given in capsules after meals. Sod bic. in 1·0 g. capsules before meals. The urine remained alkaline, but tinnitus and the reaction of Tanret in urine proved quinine absorption.

The following points are of interest in this case:—(1) Both in the initial attack and the relapse the disappearance of hæmoglobin from the urine, which was formerly acid, followed a few hours after it showed an alkaline reaction. (2) This was effected solely by the oral administration of sodium bicarbonate (and the citrates of lemonade) in doses up to 21 g. in 24 hours. Bilious vomiting which caused rejection of the first few doses was controlled by frequent sips of this alkaline fluid. (3) The relapse on the tenth day followed a couple of 0·6 g. (10 grains) doses of quinine when the urine was acid, whereas 1·2 g. (20 grains) was taken with impunity ten days later when the urine was kept alkaline. (4) Sodium bicarbonate in large doses is easily detected in the urine by the effervescence of CO_2 caused by the addition of an acid. The hæmoglobin in such urine gives a very slight cloudy precipitate on boiling, whether previously acidified with acetic acid or not, possibly on account of the formation of alkaline ageusia over the area supplied by the chorda tympani nerve. And the loss of taste perception seemed to be permanent. A considerable number of cases of middle-ear suppuration showed a lesion of the chorda tympani; also that nerve was most frequently damaged in cases in which the middle-ear disease was of long standing and affected the attic, and was attended by cholesteatoma. In many advanced cases of middle-ear disease the integrity of the chorda tympani was fully preserved. Thus no useful deduction as to the extent of the disease in a particular case could be drawn from the integrity or from the destruction of the chorda tympani nerve. Mr. Vlasto gave the results of the testing of nine male patients in a hospital ward.

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[1] Cooke, W. E., and Willoughby, H.: THE LANCET, Feb. 16th, p. 334. Hanschell, H. M.: Trans. Roy. Soc. Trop. Med. and Hyg., 1926, xix., 488.

Dr. JOBSON said otologists frequently learned of distortions of taste after the radical mastoid operation had been done. Several times his patients had complained of a foul taste after such operation; some said they had a metallic taste.

Mr. G. J. JENKINS said that occasionally patients with chronic suppuration complained of a burning sensation on the anterior part of the tongue, on one side. Tumours in the neighbourhood of the ear also sometimes caused aberration of taste in the tongue, a taste as of ink, or a burning sensation.

Dr. C. S. HALLPIKE read a detailed paper on the subject of

Bone Conduction.

He submitted that increased bone conduction, as exemplified by the Schwabach test, in cases of affections of the conducting mechanism of the ear, was one of the basic facts in otology. The theories of Bezold and others, which attributed the phenomenon to changes in rigidity of the ossicular chain, Dr. Hallpike regarded as unsatisfactory. He himself believed that the increase in the bone conduction was due to a screening effect upon cochlear function of the damaged middle-ear mechanism. Two lines of investigation suggested themselves. First, there was a disappearance of the increase under conditions of equal screening for the observer's cochlea. These conditions were supplied by the absolute bone conduction test. The truth of findings with this test was now definitely established. The second line of investigation was the disappearance of the increase in conditions of absolute silence, where screening effects would be inoperative.

Examination of cases of conducting deafness in absolute silence showed a tendency for the increased bone conduction found under ordinary conditions to be reduced to normal limits. In many cases of chronic deafness, cochlear loss was present, but it was latent because of the concomitant screening effect of the middle-ear damage, which tended, under ordinary circumstances, to lengthen the Schwabach response. This cochlear loss, from the point of view of prognosis and treatment, was a sign of the first importance. As shown under ordinary conditions it was latent. The absolute bone-conduction test, the logical outcome of the theory put forward, rendered it manifest. The main part of Dr. Hallpike's contribution was concerned with the consideration of sensory fields in general, and of screening effects in those fields. Dr. Hallpike described a new apparatus to show screening effects in the retina.

The PRESIDENT remarked on the fact that the Section had appointed a Committee to consider ear tests.—The paper was discussed by Mr. WATKYN-THOMAS, Mr. JENKINS, and Dr. YATES.

Mr. ALEX. R. TWEEDIE gave a demonstration of an

Apparatus for Control of Conversation Test.

By this means a person speaking into a magneto microphone would be able to note the exact point at which a person ceased to hear. It was so designed that the person being tested could, if required, repeat words spoken by the observer who was conducting the test. The receiver was quite inactive unless both switches were closed. Tests were made of the apparatus by various members.

Reviews and Notices of Books.

THE MODERN TREATMENT OF HÆMORRHOIDS.

Second edition. By JOSEPH FRANKLIN MONTAGUE, M.D., F.A.C.S., of the Rectal Clinic, University and Bellevue Hospital Medical College. London: J. B. Lippincott Company. Pp. 298. 21*s.*

IT is evident that the author's views on the treatment of hæmorrhoids have undergone no marked change since the publication of the book three years ago. Pronounced internal hæmorrhoids mostly demand operation. He uses the method of transfixion and ligature with catgut for clean cases, and the clamp and cautery for ulcerated, thrombosed, and gangrenous piles. The Whitehead operation is condemned. Dr. Montague shows a preference for local anæsthesia, and speaks strongly against the current practice of preparing cases for operation by purgation and enemata; a much less drastic preparation is suggested which he thinks leads to lessened post-operative discomfort and quicker recuperation. This plan is certainly worthy of trial.

As regards the injection treatment, the author still prefers a 20 per cent. solution of cresylic acid in glycerine and water, and places 5 per cent. quinine-urea and 10 per cent. carbolic acid in olive oil next in order of merit. He makes no particular reference to the method, advocated strongly by Albright and by Blanchard, in which high submucous injections of 5 per cent. phenol in vegetable oil are given; this solution is considered by many to be more effective and free from risk than the stronger solutions. Dr. Montague's recommendations as to dosage are very vague, amounting only to the advice that the injections should be stopped as soon as the slightest blanching of mucous membrane is seen. He practises injection into the centre of the pile mass; this is a point in technique on which there is considerable difference in opinion, but we cannot recommend anyone to follow closely the technique illustrated in Figs. 97, 99, 101, in which the needle is shown inserted into the lowest border of the pile, at the upper end of the anal canal. This is the one place, being so close to the sensitive epithelium of the anal canal, where the injection should not be made. The mucous membrane should be punctured at least an inch or more above the point shown. In Chapter 15 the results of treatment of hæmorrhoids by radium are given. The method of implanting and leaving in situ glass radon seeds proved unsatisfactory on account of the irritation caused by the presence of the foreign bodies, and Dr. Montague now advocates removable platinum-screened seeds (4 millicuries). Cessation of hæmorrhage and fibrosis are said to unfailingly follow their use, but whether this or the various electrical methods described in the following chapter will ever be found as practical as the injection method seems to us doubtful. The use of a suction-pump, here illustrated and recommended for the diagnosis of hæmorrhoids, is regarded as obsolete by most authorities. Practitioners would probably appreciate the elaboration of the chapter on the injection methods, and the supply of detailed descriptions of technique and dosage, together with some facts about recurrence-rates.

DISEASES AND DEFORMITIES OF THE SPINE AND THORAX.

By ARTHUR STEINDLER, M.D., F.A.C.S., Professor and Head of the Department of Orthopædic Surgery of Iowa State University Medical School, Iowa City. London: Henry Kimpton. 1929. Pp. 573. 52*s.* 6*d.*

THIS is an authoritative and well-balanced treatise on the subject of diseases and deformities of the spine and thorax. The opening chapter on congenital deformities of spine and thorax contains well-arranged information, and is illustrated by plates showing both the deformity in the patient and the X ray picture. This is followed by a chapter on the static antero-posterior deformities of the spine and then by one on scoliosis, which is perhaps the best in the book. The mechanics, dynamics, pathology, diagnosis, and prophylaxis of scoliosis are discussed fully and clearly, and finally the difficulties of treating this deformity are considered in detail. The advantages and disadvantages of various methods are set out impartially, and the reader is left in no doubt as to the method suitable in any particular type of case. This chapter also is well illustrated. The fourth chapter deals with fracture and dislocation deformities, and the fifth with low back pain. The author's experience and knowledge enables him to bring together the widely separated conditions associated with this symptom into an orderly classification. Tuberculosis, osteomyelitis, syphilis, chronic arthritis, and tumours of the spine make up the reminder of the book, and each subject receives the critical treatment which enables the reader to come to his own decisions and conclusions. A full bibliography is given at the end of each chapter and a valuable synopsis of the anatomy of the spine is contained in an appendix. Prof. Steindler has added to the literature of orthopædic surgery a book worthy of his reputation, and the work is well produced.

ARTIFICIAL SUNLIGHT AND ITS THERAPEUTIC USES.

Fifth edition. By FRANCIS HOWARD HUMPHRIS, M.D., F.R.C.P. London: Humphrey Milford, Oxford University Press. 1929. Pp. 346. 10*s.* 6*d.*

Dr. Humphris's handbook, now in its fifth edition, has for some years been a popular introduction to the study of actinotherapy. It is clearly written, well illustrated, and contains a useful survey of apparatus, technique, and indications for clinical guidance. An elementary exposition of actinotherapy necessitates a dogmatic presentation, and this unfortunately may easily convey the impression—to the reader not familiar with the subject—that the statements are all based on well-ascertained facts. Unfortunately, hypothesis still plays a prominent part in any attempt to explain the action of light on the living organism, and only some of the end-reactions are known to us. The indirect action of ultra-violet light, for instance, on the ductless glands, now freely quoted in text-books, still rests on scanty experimental evidence and on clinical findings which are often contradictory. It is interesting to note that Dr. Humphris mentions glycosuria as one of the main contra-indications to light treatment, whereas Pincussen and Rothman claim to have obtained clinical improvement, diminished sugar excretion, and lowered blood-sugar by light treatment in diabetes.

ANNALS OF THE PICKETT-THOMSON RESEARCH LABORATORY.

Edited by DAVID THOMSON, O.B.E., M.B., Ch.B. Edin., D.P.H. Camb., Hon. Director, Pickett-Thomson Research Laboratory, St. Paul's Hospital, London; and ROBERT THOMSON, M.B., Ch.B. Edin., Pathologist to the Laboratory. Vol. IV., Parts I. and II. London: Baillière, Tindall and Cox. 1929. Pp. 494. 42*s.* each volume.

THE first of the two parts which together form Vol. IV. of the publications of this laboratory, and which appeared in November, 1928, is reviewed here together with the second, which has just appeared. The subjects dealt with are the rôle of the streptococci in rheumatic fever, chorea, erythema nodosum, carditis (including endocarditis), acute and subacute arthritis, chronic arthritis, and a consideration of Rosenow's theory of elective localisation. Like their predecessors, these volumes consist almost entirely of elaborate excerpts from the already published work of others. From this point of view the publications have value, since the quotations given are very widely drawn and conveniently grouped. Their collection reflects the energy of the editors, who have provided a valuable series of references and abstracts, being mostly the ipsissima verba of the workers, and being free from that unconscious editorial distortion which may greatly detract from the value of reviews.

The authors, partly in collaboration with Dr. Warren Crowe, have now for some time been occupied in the collection and classification of a very large number of species of streptococci, and have evolved a classification depending upon a large number of properties, in particular the naked-eye appearance of colonies and the morphology of the organisms in films. They have expended an immense amount of time and energy in this work, and have provided some beautiful illustrations produced with excellent photographic technique. As regards the larger question of the meaning and value of their classification, it is the opinion of many bacteriologists that their energies are largely misapplied. The methods may be criticised from two angles. First, as to their accuracy, morphology, except in its broadest aspects, is notoriously an unsafe guide in bacteriological classification. The most potent diphtheria bacillus may appear to be a coccus; the morphology of the Pfeiffer group is extraordinarily variable; and amongst the streptococci the lack of fixity of morphological characters is extremely well marked. Small variations in the composition of media, in pH, in moisture of solid media, will cause corresponding variations in morphology, often, it is true, not of a gross type but sufficient to be significant where the finer shades of morphological difference are being relied upon. In the second place, it is pertinent to ask what is the result of this system of classification? The authors divide the organisms into five main primary groups, upon their morphological appearance upon a boiled blood medium. Each of these groups is subsequently split into subgroups, depending on lesser variations of the same nature and the microscopic characters of the organisms. As a result the number of subgroups already reaches 21, and the authors hold out the prospect of more to come. Within these 21 subgroups species are recognised as a result of fermentative reactions with ten sugars. In the end, and with sufficient perseverance, the possible result will be the recognition of many thousands of different types, each of which the authors apparently hope to perpetuate by indexing and by recording the photographic characters of each strain in seven different photographs. Their apparent aim is to produce a permanent record of as large a number of characters as it is possible to examine for each and every strain of streptococcus passing through their hands and, in the end, to achieve something akin to a Bertillon system of identification.

In assessing their work from this view-point we find that the primary classification by means of colour differences upon boiled blood media is defective, in that these functions are not correlated with hæmolysin production, nor with heat resistance, two properties which in the present position of our knowledge do seem to introduce real lines of division that have some practical meaning. Now, what is the real meaning of the differences which the authors adduce? That they are there, and may be of interest, does not of itself warrant their being used for classification. The streptococci are an almost infinitely variable group of organisms, and in a practical world we want to see the woods and not be confused by an infinity of trees. Classification, as a fine academic art, may be blamelessly pursued, but in medical bacteriology it is barren unless it has a practical meaning. The over-elaborate system devised by Dr. David and Dr. Robert Thomson, even if the factors used in it are not open to serious experimental variations, which there are reasons to doubt, tends to lead rather to confusion than to clarification of the subject. The pebbles on a sea-shore may be classified in many ways. They may be roughly designated *large*, *medium*, and *small*, and such a distinction may be of real value to the road-maker, ballast-seeker, or gardener. But if we take equal cognisance of a wealth of other properties, such as accurate weight, shape, colour, roughness or smoothness, specific gravity, chemical composition, and so on, we get a classification which will be highly elaborate and may be even scientific, but will be of little use in a work-a-day world where life is short. What we require in a sound classification of bacteria is a few main features which give indications of real use—and this the scheme outlined in these monographs fails to give.

The volumes contain also a short original paper by Dr. Warren Crowe upon the experimental production of foci of infection in rabbits, and its bearing upon osteo-arthritis. His experimental evidence goes to show that a focus of chronic infection may produce a lowering of resistance to bacterial invasion, not only locally but at a distance, and may favour the settling of organisms in sites which may otherwise escape. He also claims that certain streptococci have an innate tendency to localise in the articular ends of bone, and may be found there when absent from the heart's blood or from the shaft marrow. Under conditions of lowered resistance, due to artificial chronic infection, this "osteotropic" faculty may be relatively enhanced. Whilst generally adverse to E. C. Rosenow's elective localisation views, Dr. Crowe appears to admit such a mechanism in his own experiments. It is not clear if due regard has been paid in this work to the relative chances of foreign particles in the blood stream being localised in the more cancellous marrow of the ends or in the less complex marrow of the shaft. This might be an essential factor in the results obtained.

A SURGICAL DIAGNOSIS.

By J. LEWI DONHAUSER, A.B., M.D., F.A.C.S., Clinical Professor of Surgery, Albany Medical College (Union University). London and New York: D. Appleton and Co. 1929. Pp. 799. 42s.

THIS book is based on the author's 20 years' experience in surgical teaching, and contains information invaluable to the student working for an examination or to the practitioner confronted by a difficult surgical problem. After introductory chapters on the taking of a careful history, the examination of the patient, and the interpretation of laboratory data, chapters are devoted to the infections and to tumours. This chapter on tumours might well be expanded in future editions, and some illustrations should be added. The remainder of the work is on a regional plan, the lesions of the region under consideration being considered in turn with their ætiology, signs, and symptoms; included in each chapter are charts showing the differential diagnosis of the main regional diseases, which summarise the chief symptoms in a way that is readily grasped. A number of more detailed charts deal with the differential diagnosis of either diseases, symptoms, or signs. When seeking information on a number of the less common problems of surgical diagnosis we were not disappointed. Dr. Donhauser may well be pleased with the results of what must have been prodigious labour. He has produced a book of sound surgical teaching and attacks the problems of diagnosis in a way that is both original and satisfactory.

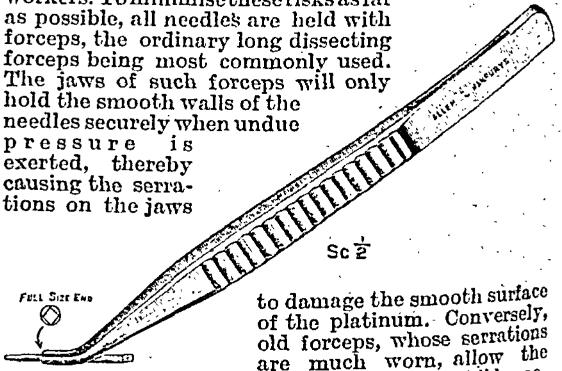
JOURNALS.

BRITISH JOURNAL OF CHILDREN'S DISEASES. Vol. XXVI. April–June.—Mr. J. D. R. Murray contributes a paper on eight cases of Acute Intussusception in Infants. An account of these cases was given in THE LANCET of April 20th (p. 826).—Writing on Rheumatic Fever and Tonsillitis, Dr. J. Tertius Clarke maintains that the geographical distribution of *Ceratophyllus fasciatus*, the common rat-flea of northern temperate climates, and of rheumatic fever is so similar as to make it seem possible that the insect is in some way connected with the ætiology of the disease. He finds coincidence not only of geographical and local distribution but also of temperature and humidity.—Dr. F. Parkes Weber contributes a note on Herpes Zoster and its Connexion with Arsenic and with Varicella, in which he describes cases of herpes occurring during arsenical treatment, being followed in the course of the next fortnight by varicella in other individuals with whom they had been in contact. He comes to the conclusion that arsenical herpes zoster should be regarded as ordinary herpes zoster, an unknown causative virus of herpes zoster possibly already present in the body becoming activated by the arsenic.—Dr. Angélique Panayotatou, of Alexandria, records a case in a boy, aged 2½ years, suffering from a severe attack of kala-azar who was cured by rectal injections of tartar emetic.—Mr. Macleod Yearsley contributes a paper on Intestinal Toxæmic Deafness in Children in which he maintains that there are catarrhal conditions of the upper air passages with or without middle-ear complications which refuse to clear up until the primary intestinal toxæmia has been properly treated. He records three illustrative cases in boys, aged 7, 8, and 8½ years, in whom deafness due to affection of the internal ear was much improved by treatment of chronic intestinal intoxication.—Dr. J. H. Twiston Davies and Dr. R. L. Flett report an Unusual Complication in a Vascular Nævus. The patient was a male infant, aged 3 months, who developed streptococcal infection of a large nævus on the left shoulder followed by abscesses in the right groin and hand. Death was preceded by jaundice and pneumonia. In addition to pneumonia the necropsy showed pus in the left pleural cavity, recent vegetations on the mitral and tricuspid valves, purulent perisplenitis, and perihepatitis.—The abstracts from current literature are devoted to diseases of the newborn.

New Inventions.

RADIUM FORCEPS.

THE constant handling of radium needles, particularly in the "making-up" room where they are threaded or placed on the surface of Columbia paste collars, is associated with definite dangers to the workers. To minimise these risks as far as possible, all needles are held with forceps, the ordinary long dissecting forceps being most commonly used. The jaws of such forceps will only hold the smooth walls of the needles securely when undue pressure is exerted, thereby causing the serrations on the jaws to damage the smooth surface of the platinum. Conversely, old forceps, whose serrations are much worn, allow the needles to "shoot out" immediately any pressure is applied to them, with the result that the needles may be difficult to recover, or even lost altogether. I have had made, therefore, the forceps here illustrated. They are shaped like the well-known Childe's dissecting forceps, but having angular-cut jaws they readily adjust themselves to, and firmly hold, without undue pressure, any needle from 1·75 mm. diameter to 2·2 mm. diameter.



Messrs. Allen and Hanburys, Ltd., 48, Wigmore-street, London, W., are the makers.

F. E. CHESTER-WILLIAMS, M.R.C.S. Eng.
Radium Therapy Dept., Royal Infirmary, Bradford.

THE LANCET.

VDON: SATURDAY, JUNE 29, 1929.

IMISM IN THE INDIAN MEDICAL SERVICE.

Indian Medical Service still offers a good vith interesting work, fair pay, and a fair at the end. This was the message of Colonel RD'S address to his brother officers at the linner of the Service held last week in London. likely, he said, that the Service will ever again a British Foreign Office with an Ambassador it will again provide a Governor for Bengal; hardly hope to reach the success attained by en as Sir JOHN MCNEILL and Sir JOSEPH ; but, he added, if I had to live my life over, live that life again in the service of medicine a. Colonel CRAWFORD was followed by Sir D ROGERS, who is now Medical Adviser to etary of State and who alluded to the I.M.S. greatest imperial medical service the world seen. It may be gathered that the occasion much more cheerful nature than some of the gs held since the war put the fortunes of all ian services in the melting-pot. Far-reaching have been in the air and some of them were affect the prospects of new entrants adversely. ort of the Lee Commission in 1924, however, the air, and in that year we felt justified in out the favourable significance of some of proposals, and the attractions which the still offered to newly qualified men. Subsequent ments have strengthened this impression, on seal has been set by certain additional ons now to be granted, of which an official ement is imminent. Four years ago it was that while many improvements in pay and onditions of service had been effected, there cause for misgiving. The reduction of civil gether with a difficulty in obtaining suitable and the consequent inability of the military ent to release its medical officers, often the prolonged retention in the Indian army who wished for civil work, and there was a insecurity regarding the civil administrative hich it had been proposed to throw open to tside the Service. It was also felt that nents might occur during the next few years ould affect the position adversely in various d that some guarantee of permanent employ, atively, a system of gratuities in the event of re retirement, was desirable. We understand a result of discussions which have been ng for some time these requirements have en met, and that in other ways also the ns of service have been much improved. The already been very considerably increased, reduction of civil posts was largely compen- y the fact that those relinquished were y the smaller and less desirable stations. concessions with regard to free passages are y important. Then, owing to the necessity viding for European troops and civilian ions, it has been decided to retain two-thirds total existing posts, military and civil, for ans. It has now been ruled that so long as there remains in the Service a single I.M.S. officer who was in civil employment when the scheme was published last year (that is, for more than 20 years to come) administrative posts will be filled by I.M.S. officers appointed directly by the Government of India. Furthermore, from the beginning of the present year the military department in India will be content with 22 British medical officers, instead of the 72 who have recently been required, a concession which has been rendered possible by the improvement which has taken place of recent years in recruitment. Particularly heartening is the high standard of candidates coming forward, which is shown in the excellent results obtained in the examinations at Millbank.

There is, in short, every sign of a revival in the fortunes of this ancient and distinguished Service, and not the least encouraging symptom is the tendency of officers appointed under the new rules to engage for permanent employ rather than avail themselves of the facilities now provided for early retirement with gratuities. A reference to the revised regulations for the recruitment of European officers and the improved rates of pay (as set out in our advertisement columns) will, we think, taken with all these considerations, show that the Indian Medical Service still merits the attention of that considerable section of the graduates of our great medical schools which does not feel drawn to the ordinary round of general practice at home, and may be attracted by the wider opportunities of work in India. There is no reason why some of the best men of the schools should not find the prospects as attractive as heretofore. A survey of the Indian Army list shows four names in the medical service to which the letters F.R.S. are appended, and countless higher professional qualifications bear witness to the reputation of the Service in the past. There are, of course, certain conditions of climate and family life which have to be faced before taking up residence in a country six thousand miles away and largely within the tropics, but even these have been much improved by modern transport facilities, and for anyone who is disposed to adventure India has much to offer. To those who are prepared to accept the general spirit of the reforms, work in association with Indians, on an equal footing, may be made very pleasant. It is a mistake to assume that the attitude of an Indian who happens to be placed in a high official position is necessarily hostile to Europeans serving under him, and experience has shown that efficient Englishmen of the right stamp, particularly in the more technical departments, are increasingly appreciated as their numbers diminish. We have consistently advocated the reforms which have conduced so largely to this improved position, and we welcome the dissipation of the cloud which has hung too long over medical service in India.

ANTIBODIES IN RELATION TO IMMUNITY.

VERY early in the study of bacteriology, almost as soon as it was recognised that micro-organisms could cause disease, attention was directed to the reactions resulting in the body, and elaborate theories of immunity were formulated. Such hypotheses were no doubt of value as a basis for future work, for without some conception of the nature of a problem progress is impossible. But as time went on it became more and more apparent that these hypotheses did not explain the phenomena of infection and immunity. Theory, in fact, had outgrown observation, and the recognition that this was so was followed by a tendency to belittle the practical value of immunological observations. Recent work has done much to clear away the ambiguities of the past. More careful and detailed experiments have reconciled apparently conflicting views and have established beyond reasonable doubt many of the factors which govern the antigen-antibody reactions. Nevertheless the whole subject of the natural acquirement of immunity seems to have passed beyond the comprehension of the average medical man; and even the laboratory worker, unless he is actually engaged in the study of immunology, is scarcely in a better position than the clinician to appraise the trend and value of current work, for the subject has become as complicated as it is important. A communication by Prof. W. W. C. Topley, which appears elsewhere in this issue, suggests that the complications are more apparent than real and are often enough legacies from the past. As he very clearly shows, if we confine ourselves to authentic observations and the inferences which may reasonably be drawn from them, we possess a conception of immunity which takes us a long way and is full of promise for the future.

The problems are, of course, too vast to be discussed otherwise than superficially in a single address, but Prof. Topley defines the more important conclusions which our modern knowledge seems to justify. He points out that the older idea that a bacterium, acting as a single antigen, calls forth several different antibodies, has given place to the view that whereas the bacterium may contain several antigens, each of these antigens is capable of giving rise to one, and only one, antibody. The immunological value of the different antibodies is not always the same; some may profoundly modify the infective process, while others may have little or no effect on it. It is well known, for example, that infection with the typhoid bacillus causes the appearance of agglutinating antibodies in the circulating blood. These agglutinins are of two kinds, corresponding to two different antigens contained in the bacterium; one agglutinates the flagella, the other the body of the organism. The flagellar antibodies occur in large numbers, but appear to have no effect on the infective process; the somatic antibodies are numerically far inferior but are of real immunological significance, for they are responsible for the phenomena of bacteriolysis and opsonification. The recognition of the different immunising values of different antigens explains why, in some cases, active infection may be accompanied by the appearance of antibodies in quantities in the circulating blood, while in other infections a significant degree of immunity may be established apparently without the development of antibodies which can be detected. The haphazard search for antibodies in the circulating blood is useless; we must first determine which of the various bacterial antigens is the important one, and then concentrate on the search for its specific antibody. There is good evidence to show that multiplicity of antigens is associated with a complexity of bacterial structure hitherto unsuspected. Certain antigens are associated with nucleo-proteins, others with polysaccharides, and of these the polysaccharide antigens appear to be the significant ones in the production of in vivo immunity. The actual position of these different constituents of the bacterial cell is of importance, for the first reactions between the invading microbe and the fluids and tissues of the host must take place at the surface of the bacterium. If the surface of the bacterium contains antigens which possess the property of virulence the host may produce antibodies which attach themselves to the surface of the microbe and so neutralise the specific poison. But if the superficial antigens, the flagellar antigens of the motile bacilli, for example, are of no infective importance, the immediate antibody response may immobilise the microbe while failing to protect the host.

Another interesting phenomenon to which Prof. Topley draws attention is the persistence in the tissues of immune animals of the specific infecting organisms. If an animal is artificially immunised by an appropriate vaccine it may be able to withstand a subsequent inoculation with virulent bacteria, yet these same bacteria may often be recovered from the spleen in a condition of full virulence several weeks later. And the same kind of thing may be noticed after a natural infection. In other words, antibodies do not sterilise all of the tissues, though they may be sufficiently powerful to keep clean the ordinary paths of invasion and so prevent subsequent infections. Virulent bacteria may remain latent in the tissues for long periods of time even though the animal may be apparently healthy and immune from fresh external infections; and various non-specific factors may determine a recrudescence of infection from within. The revival of latent tuberculous infections is, of course, a commonplace of clinical medicine, but that a similar process can occur in the more dramatic acute infections is less generally recognised. There are other phenomena, however, which suggest that we are still far from a complete understanding of the processes of infection. In some established infections, in malignant endocarditis for example, organisms may live and proliferate in direct contact with the blood stream though they are killed if they are transported from the heart valves to other tissues and organs of the body. The actual mechanism of immunity is still hidden though there is evidence that we are groping very near the truth. Antibodies appear to sensitise bacteria in such a way that they become more readily ingested by phagocytes or destroyed by other means. We are unable, however, to express this process of sensitisation in the more accurate terms of chemistry or physics. But this no doubt will come in time. Meanwhile, as Prof. Topley says, we are justified in claiming that our conception of antigen-antibody reactions is as authentic as many of those which are regarded as fundamental in other branches of biology.

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RESEARCH AND ROWDYISM.

Prof. A. V. Hill chose a good title for the attack upon the antivivisectionists which he delivered as the Stephen Paget Memorial Lecture—"The Enemies of Knowledge." For the real defence of vivisection is not that it is useful, not that it has played a considerable share in ameliorating man's material state, but that it is a means of finding out things which could not be discovered by any other method. Those who put forward the argument that vivisection should be allowed because of its practical utility to medicine do so on good grounds, but are stating only a part of what might be stated better. They may never have asked themselves what should be said if animal experimentation ceased to be of material benefit. Here Prof. Hill, in his address, which we publish elsewhere (see p. 1385), takes the line of the idealist rather than the opportunist, and supplies the fitting answer. It is idle to wonder whether knowledge is worth having or not and whether perhaps men would be better off if they did not know so much. No serious minded man with any apprehension of modern biology will waste his time on such questionings. Knowledge may be good or it may be ill, but its acquisition is the larger part of man's evolutionary destiny; in hunting after knowledge man is filling most truly his place in nature; to refuse to do so is to blaspheme.

Man has, in comparatively recent times, added the arts of kindness and gentleness to his evolutionary programme; to be unkind has become blasphemy too, and we are faced with something of a dilemma such as progress must have posed often enough before; super reptiles, for example, must have been in something of a quandary when they were faced with the advantages of being warm-blooded and the disadvantages of having to get the vastly greater amount of food which warm-bloodedness needs. And of such dilemmas there is probably no solution available at the moment when they occur, but those who are inspired with the zeal for knowledge feel that endeavour to acquire it should not be baffled. Others equally sincere may not place the same value on particular endeavour, and well-informed criticism deserves serious consideration. But ignorance, especially wilful ignorance, cannot obtain a similar reception and the facts about animal experimentation are misunderstood by many of those who sit in judgment upon the progress of science, while many more have never acquired the facts. It is the strictures of these, especially of the last class, which lead to the undesirable element of partisanship, that in London recently took the overt form of the deplorable scenes of which everyone has heard: Prof. HILL's meeting, commemorating one of the kindest and gentlest men that ever was, ended in "considerable turmoil," while the Caxton Hall meeting of the British Union for the Abolition of Vivisection scarcely began, but ended in the police-court. The acquisition of knowledge and the cultivation of kindness are both good causes; neither is helped by rowdyism.

VICTOR HORSLEY MEMORIAL LECTURE.

THE Third Victor Horsley Memorial lecture will be delivered at University College Hospital on Tuesday, July 16th, at 5 P.M., by Sir Thomas Lewis, Sir John Rose Bradford presiding. These memorial lectures were established as a result of a trust instituted in 1921 to perpetuate the name of the great physiologist and surgeon and the subscriptions rapidly reached a total of over £1000, when the money was invested in the name of a board of trustees with the responsibility of arranging for the delivery in London of a lecture triennially. The first Victor Horsley Memorial lecture was delivered in 1923 by Sir Edward Sharpey-Schafer, who dealt with the Inter-relations of Surgery and Physiology; the second was delivered in 1926 by Mr. Wilfred Trotter who took as his subject the Insulation of the Nervous System. Sir Thomas Lewis will lecture upon the Mechanism of Raynaud's Disease. The subjects of these three lectures are closely related to Horsley's life work, but the terms of the trust place no limit on the theme of the lecture, nor need the lecturer be himself either surgeon or physiologist, and thus a good opportunity is afforded for wide surveys of scientific progress.

ALEXANDRA DAY IN LONDON.—It is reported that the London collections on Alexandra Day produced £50,535, about £3000 more than last year.

Annotations.

"Ne quid nimis."

NOTIFICATION AND ACUTE RHEUMATISM.

The first annual report on the Rheumatism Scheme of the Royal Borough of Kensington is the record of an experiment of some importance in the campaign against this destructive disease. The Kensington scheme includes compulsory notification, a supervisory centre, in-patient accommodation, treatment during convalescence, and home visiting. The authors of the report consider that, in conjunction with the other activities of the public health authority, which it facilitates, notification has been of paramount importance to the scheme. Acute rheumatism for purposes of notification is the occurrence, separately or together, in a child under 16, of rheumatic pains and arthritis with pyrexia, rheumatic chorea, and rheumatic carditis. The number of cases notified was 159, of which 81 attended the centre. Of these 81 cases, 8 were definitely not rheumatic, and in 6 the diagnosis was doubtful. The mistake in four of the wrongly diagnosed cases was the confusion of habit-spasms with chorea. The result suggests that there may be a similar error of 10 per cent. in all statistical calculations based on the results of unconfirmed notification of rheumatism. The authors remark that, with the exception of tuberculosis, there is probably no common notifiable disease with a higher rate of mistaken diagnosis. Moreover, at least half of the notifications were made by practitioners well accustomed to rheumatism. It is improbable that the total of notified cases represents more than a rough guide to the incidence of rheumatism in the borough, since the local practitioners have presumably not yet all acquired the habit of notification, and some of the existing cases are attended by practitioners from outside the area, or by none at all. Nevertheless, the number is already two and a half times that of the notified cases of tuberculosis in children under 16. The percentage of patients coming from damp dwellings is 37·7, a figure very close to that given by the Medical Research Council but considerably less than that given by the British Medical Association. The figures for lighting, ventilation, and personal cleanliness show that such defects are not ætiologically important, but the authors suspect that uncleanliness of rooms is at least a contributory factor. The heaviest incidence does not correspond entirely to the flood areas and the report suggests the conclusion that dampness of site is not the important factor, unless the house is in some way defective, or that the social and hygienic conditions which accompany congestion are as important as, or even more important than, the dampness itself.

The Kensington authorities also investigated another factor which has been put forward as a possible cause of acute rheumatism. In a paper read before the Royal Society of Medicine in February of last year, Dr. J. Tertius Clarke brought evidence to show that the geographical distribution of rheumatic fever coincided with that of the common rat-flea, *Ceratophyllus fasciatus*. The Public Health Department already knew the rat-infested areas of the borough, and they were plotted on the map which showed the sources of notification. The rheumatism and the rats undoubtedly coincided to a certain extent, and a search for a third factor common to both, which would account for an indirect association between them, showed that the railways, which are the favourite breeding places of rats, are largely situated in low-lying, and therefore damp, areas. This indirect association, however, only holds good if a relation be assumed between dampness and acute rheumatism. Moreover, rats are encouraged by defective housing and untidiness; they do not seek damp surroundings, but rather surroundings in which damp is incidental. Rats and rheumatism coincide more closely in Kensington than damp and rheumatism. These interesting results certainly suggest that Dr. Clarke's theory should be investigated further. The authorities of the borough believe that the solution of the rheumatism problem lies in eradicating the conditions which constitute poverty, overcrowding, deterioration of house property, and difficulty in obtaining the necessities of life. They do not record what many other investigators have noticed—namely, that the incidence of rheumatism is considerably higher among the comparatively poor than among the very poor. This is perhaps because actual destitution is rare in the Royal borough. Nevertheless, if this observation of other workers is correct, it would further support Dr. Clarke's theory, for rats would naturally infest the dwellings of untidy and wasteful persons rather than those whose inhabitants consume every particle of food.

The second part of the report is a valuable treatise on juvenile rheumatism from the clinical aspect, by Dr. R. C. Lightwood and Dr. M. L. Davies. In the absence of a specific remedy and of a certain means of protecting the heart of the rheumatic child, the primary object of a supervisory centre is, they say, to prevent relapses by providing as good management and surroundings as possible, and to supervise the after-care of children whose hearts are already affected. The chief measures directed against recurrence are correction of unsuitable environmental conditions, attention to general health, treatment of diseased tonsils, and education of the parents. Temporary removal to a convalescent home is largely a line of least resistance and can be permanently effective only if the children return to improved surroundings and better management. Much good work is done by the Invalid Children's Aid Association, which visits the homes of all rheumatic children and gives advice and instruction to the mother. Moreover, many housing defects are remedied by the Public Health Department. It is important, when diagnosing the conditions of each child, to decide whether the disease is in an active or a quiescent stage. Active cases require thorough and sustained treatment. If the family can afford a private doctor, they are advised to call him in; if they cannot, the child is sent to a hospital. Quiescent cases are examined at appropriate intervals, and many of them, together with all children discharged from hospital, are sent to convalescent homes. The special schools for physically defective children are invaluable for some of the older children who suffer from relapsing rheumatism or for those whose hearts are too badly damaged to allow them to attend the ordinary County Council schools. It appears, from the analysis of 200 cases of rheumatic children, that the females preponderate at all ages, but especially between 11 and 13. The highest relative incidence in male children is between 5 and 8, but the highest peak is at 12 for both sexes. Heart disease was found in 17·5 per cent., none of whom improved under observation. Fifty-four per cent. had normal hearts when first inspected, but four of these subsequently developed heart trouble. The remaining 28·5 per cent. were classed as doubtful; 12 improved under observation and one deteriorated.

There appears to be no relation between the state of the heart and tonsillectomy, but the investigation showed that the tonsils had been incompletely removed in 45 out of 85 tonsillectomised children, a proportion which suggests that the guillotine operation needs much skill and experience. The fact that rheumatism began in 27 children after an incomplete operation and in only 10 after a complete one indicates that complete removal gives a certain amount of protection. Moreover, the rheumatic manifestations, according to the report, were much lighter in those children who developed the disease after complete tonsillectomy. Only two children whose tonsils had been completely removed suffered from heart disease. Dental caries does not appear to be related to rheumatism, and constipation occurred in only 11 per cent. of the children examined. The proportion of children with a history of exanthemata was much the same as that noted by other workers. The first part of the report is by Dr. James Fenton, the medical officer of health, and Dr. Lightwood; whilst the second part is, as we have said, the work of Dr. Lightwood and Dr. Davies. The whole forms a useful contribution to the current knowledge of rheumatism, and we await its successor with great interest.

THE REDUCTION OF INTUSSUSCEPTION.

THE danger of delay in the acute intussusception of children makes one chary of putting off operation in order to try other forms of treatment, and manipulation and enemas have therefore been abandoned in favour of immediate surgical interference. A method of reduction by manipulation and barium enemata under close radiological control nevertheless seems worth consideration, and the results of treatment on these lines in five acute cases in young children have lately been described by Dr. Jacob Nordentoft.[1] In three of them reduction was effected successfully. In the fourth case manipulation failed; operation revealed an ileal intussusception which had progressed further and invaginated the colon; and the child died after this had been reduced with great difficulty. In the fifth case, which was of the colo-colic variety, manipulation was a failure but operation proved successful. In all the cases the intussusception had a characteristic appearance under the X rays. At its apex the barium was held up by a concave line which embraced its head by two slender arms, whilst from the mid-point of the concavity a thin streak of barium could be seen trailing up the lumen of the invaginated gut. In the first three cases reduction was secured by external manipulation, by injection of enemas under pressure, and by inversion of the child if necessary. The actual process of reduction could be clearly watched radiologically, the whole colon and appendix gradually filling with barium, which finally flowed unhindered into the small intestine. Nordentoft draws attention to the value of X rays in the diagnosis of intussusception in doubtful cases, and points out that it rarely involves the use of an anæsthetic. The advantage of avoiding both an anæsthetic and an operation need hardly be emphasised, and the only question is whether preliminary manipulation affects the chances of the child surviving an operation should this be needed later. Nordentoft considers that sometimes it may actually make the operation less severe by bringing about a partial reduction.

THE HUNTERIAN MUSEUM.

ADDITIONS made during the year to the collections in the Museum of the Royal College of Surgeons of England will be on view in Room I from Thursday next until Saturday, July 27th. Many of them are of interest to medical men, more especially the fine series of specimens illustrating von Recklinghausen's disease. This disease, although uncommon, is of sufficient frequency to exclude it from the category of pathological curiosities, and usually comes before the practitioner in the form of multiple fibromata. The specimens illustrate the remarkable convoluted masses of enlarged nerves, and the extensive involvement, not only of the peripheral nerves, but also of the great plexuses, the vagi and other cranial nerves, and the sympathetic system; pigmentation of the skin is also well shown, and the less recognised alterations of bones and joints occurring in cases of elephantiasis due to the disease. The 30 new specimens of various diseases of the central nervous system form a series well worthy of study; and the same may be said of the numerous specimens of disease of the thyroid gland. Attractive single specimens cannot be enumerated but two, carrying a moral, should not be overlooked; one is a rubber tube encrusted with phosphates which was removed from the bladder of a woman 13 years after the operation of total hysterectomy; the other, a sarcoma in the scar resulting from removal of the toe for hallux valgus, the same knife having been used for excision of a sarcoma of the skin of the thigh. The number of new pathological and teratological specimens amounts to 156. To those who take an interest in the early history of disease the Museum offers considerable opportunity for study; no museum can show a collection illustrating the diseases and injuries of a prehistoric people so completely as the Nubian series presented by Prof. Elliot Smith, and including specimens dating from 5000 B.C. down to Roman times. From time to time opportunities have arisen to add specimens illustrating the diseases of the ancient British and thus the nucleus of a section of British Paleopathology has been formed. An addition to this department has recently been made by Dr. Wyatt Wingrave, consisting of fossil remains of the great reptilia found in the secondary deposits of the south of England: these illustrate various bone diseases, and represent the earliest traces of disease which have so far come under the eye of the geologist. Sir Arthur Keith refers in detail in his annual report as Conservator to the work done in other departments of the Museum—the physiological, osteological, odontological, laryngological, and historical departments—all of them showing evidence of progressive activity.

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[1] Acta Chir. Scand., 1929, lxiv., 519.

THE BACTERICIDAL SUBSTANCE IN MILK.

AMONG 48 reprinted papers in Vol. XLVI. of "Studies from the Rockefeller Institute for Medical Research "[1] is one by F. S. Jones on the bactericidal substance ordinarily present in cow's milk. Hesse in 1891 showed that raw milk inhibited for a time the growth of *Bacillus typhosus*, and Rosenau did a good deal of work on it in 1008. Thus it has long been known that milk delays for several hours the propagation of many kinds of bacteria and that the delaying action is less effective if the milk is heated. Some further information is now available as a result of Jones's researches. In the first place the concentration of the inhibiting substance seems to bear a definite relationship to parturition and lactation. The maximal concentration appears about the sixth day after parturition, and different sections of the udder yield milk of different bactericidal power. Whatever the substance may be it is not inactivated by heat in the sense that complement is, but it is destroyed when exposed to room temperature or a little higher. It is destroyed by alcohol, but is feebly soluble in weak alkalis and sodium chloride. It is present in whey; it passes through the coarsest Berkefeld filter; it is not adsorbed by casein, fat, kieselguhr, or kaolin, but it can be retained in unknown concentration by animal charcoal. It withstands desiccation and has been demonstrated in a commercial preparation of dried cow's milk. The exact nature of the substance thus unexpectedly brought to light is uncertain. Some of the earlier observers thought it would prove to be identical with blood alexin, but Jones's experiments on heating show that this is not so. The most probable suggestion is that it will prove to be an enzyme derived from food, possibly of the nature of the "lysozyme" found in tears.

NON-RECOVERY AFTER AVERTIN ANÆSTHESIA.

THE details of a case briefly recorded in the daily press on June 14th have now been made known,[2] and deserve attention from anæsthetists interested in avertin. An apparently healthy man of 25 was operated on for inguinal hernia and was given a dose of avertin of the strength 0·1 g. per kg. of body-weight. This is generally regarded as the safe strength to use as a routine. He was also given morphia, gr. ¼, half an hour before the avertin. Full surgical anæsthesia not being attained nitrous oxide and oxygen were used in addition. It is noted that there was cyanosis early in the operation, which passed off and he left the theatre after half an hour's operation with a good colour and no abnormal symptoms. Two and a half hours later he was reported to be rather cyanosed, but the resident medical officer who examined him stated that his condition was good. About two hours later, at midnight, he was reported to have become suddenly worse. Treatment with artificial respiration and cardiac stimulants failed, and he died without having recovered consciousness, some seven hours after operation. The necropsy revealed nothing abnormal, unless a thymus gland weighing about half an ounce is to be so regarded. No case hitherto reported is quite analogous with this, for there is no instance of an apparently perfectly healthy person failing to eliminate the proper dose of avertin. Death appears to have resulted from an increasing respiratory failure, but it is scarcely conceivable that this could have been due to mechanical obstruction in the unconscious patient being allowed to bring about asphyxia. Moreover, had this been so, the artificial respiration would surely have saved life in a patient with a sound heart. We have to suppose, therefore, that the avertin was not eliminated as it usually is, and the reason for this it is important to discover. For the treatment for such failure in detoxication injection of thyroxin has been suggested, and experiments in this direction have been and are being carried out. It is said that patients with exophthalmic goitre recover more quickly than others from the effects of avertin. It is worthy of note that in this patient morphia had been given beforehand, whilst omnopon was used in the only other case at all resembling it of which we have cognisance. As increasing cyanosis and respiratory failure seems to be the mode of death when avertin is not eliminated it is probable that extreme caution is necessary in employing respiratory depressants before the rectal injection.

PROF. REGAUD ON RADIUM.

IN his Cavendish lecture entitled the Progress and Limitation in the Cure of Malignant Diseases by Radium, delivered before the West London Medico-Chirurgical Society on Friday evening last, Prof. Claude Regaud, director of the Radio-Physiological Laboratory of the Radium Institute in Paris, made a brief survey of radium therapy (or Curie-therapy as he prefers to call it), from its first application for this purpose about 30 years ago up to the present time, and pointed out the enormous advances which have been made. Many different methods of attacking cancer by means of radium have been tried, but in general there were three methods in common use: (1) Internal radiation: by the insertion of radium into one of the body cavities. (2) Interstitial radiation: which is radiation by means of radium containers inserted actually into the tissues. (3) External radiation: where the radium applicators may be in contact with the surface of the body or supported at a distance away. To this method of radiation from a distance he attaches the name of "telecurietherapy" and considers that its use must always be limited by the scarcity and high price of radium. Much had been hoped for from internal radiation, but with the exception of the treatment of carcinoma of the cervix these hopes, said Dr. Regaud, had not been realised. He considered the interstitial method of radiation to be the most successful; a wider combination of surgery and radium therapy along these lines was a promising field of research in the treatment of malignant disease. He illustrated the various methods of treatment both by photographs of cases and by statistics of results obtained at the Paris Institute. Turning to the future Dr. Regaud thought that it was the radio-physiological side that offered scope for fruitful investigation; if means were found to increase the narrow margin of radio-sensitiveness, which lies between normal and cancerous tissues, it would constitute a momentous discovery. Existing obstacles in the path of the treatment of cancer by radium were, he said, very grave. They included the apparent lack in certain cancer cells of any sensitiveness to radium, the presence of widespread local extension, and, above all, dissemination of the disease. Radium is not a panacea for cancer: far from it! The public, and even medical men, do not always realise the serious difficulties which are met with in the use of radium. Whilst awaiting further developments in the radium treatment of cancer we must rely upon early diagnosis followed by early and proper treatment by surgery or such radiotherapeutic methods as are of proved value. False hopes must not be raised or wrong views allowed to prevail; and Dr. Regaud ended with a plea for enlightenment of the medical profession as well as of the general public through social and medical organisations.

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[1] Studies from the Rockefeller Institute for Medical Research. Reprints. Vol. lxvi. New York: The Rockefeller Institute for Medical Research, 1929. Pp. 636. $2.

[2] Brit. Med. Jour., June 22nd, p. 1141.

THE BRITISH ASSOCIATION'S VISIT TO SOUTH AFRICA.

IN this its ninety-ninth year the British Association for the Advancement of Science will hold its annual meeting in South Africa, and the proceedings will open at Cape Town on July 22nd with an official welcome by the Earl of Athlone, the Governor-General. The new President, Sir Thomas Holland, F.R.S., who is soon to succeed Sir Alfred Ewing as Principal of Edinburgh University, will not deliver his presidential address on the International Relationship of Minerals until the Association reaches Johannesburg, where nearly all the remaining sessions will be held. Arrangements for the general meetings will include an address on Africa and Science by Mr. Jan Hofmeyr, President of the South African Association for the Advancement of Science; an evening discourse by Sir Ernest Rutherford, President of the Royal Society, on the Structure of the Atom; and lectures by Prof. Julian Huxley on Evolution, and by Prof. G. H. F. Nuttall, F.R.S., on Yellow Fever in Africa. At Pretoria Prof. J. H. Priestley will speak on the Growth of a Tree and Prof. A. S. Eddington, F.R.S., on the Interior of a Star. Both at Cape Town and Johannesburg there will be discussions on Science and Industry. The ordinary proceedings will, of course, be divided according to sections. The Section of Chemistry will have a presidential address from Prof. G. Barger, F.R.S., on the Relation of Organic Chemistry to Biology and will later join the Section of Physiology in a discussion on Vitamins. The Section of Zoology, over which Prof. D. M. S. Watson, F.R.S., will preside, is to hear several contributions of medical interest, including one from Dr. Annie Porter on the Hookworm Problem in South Africa and one from Dr. J. F.V. Phillips on research concerning the tsetse-fly. As usual, however, members of our profession will chiefly be found in the Sections of Physiology and Psychology. Prof. W. E. Dixon, F.R.S., President of the former, has chosen for his address the subject of Physiology as the Basis of Treatment, and among other contributors to this section will be Prof. J. S. Haldane, F.R.S., on the Dissociation of Oxyhæmoglobin, Mr. L. Mirvish on Calcium Metabolism and Internal Secretions, Dr. T. M. Mavrogordato and Dr. Haldane on the Effects of Dust Inhalation, Mrs. May Mellanby on Some Factors controlling the Structure of the Teeth and their Susceptibility to Caries, and Dr. S. Monckton Copeman, F.R.S., on Cancer and Diet. Besides the discussion on Vitamins with the Chemical Section, another meeting, on the Nature of Life, has been arranged by the Section of Physiology jointly with those of Zoology and Botany. Mr. F. C. Bartlett is the President of the Psychological Section which he will address on Experimental Method in Psychology. Dr. C. S. Myers, F.R.S., will speak to this section on a New Interpretation of Adaptation and Dr. Margaret Macfarlane on Training the Mentally Unfit, whilst a joint discussion on Psychological Tests in Relation to Education and Vocational Guidance will be held with the Section of Educational Science. The latter section will also consider the question of Education and the Poor White, introduced by Dr. E. G. Malherbe; the Teaching of Biology, by Prof. H. B. Fantham; and the Professional Education of South African Natives, by Mr. D. D. T. Jabavu. The Section of Agriculture meets on the 23rd at Cape Town and on the 31st at Pretoria, where Major Walter Elliot, M.P., will be among those taking part in its deliberations. The rest of the congress will conclude at Johannesburg on August 3rd, after which a series of tours will be made in and beyond the Union, ranging as far north as the Victoria Falls.

ERGOTAMINE TREATMENT OF GRAVES'S DISEASE.

THE treatment of hyperthyroidism with ergotamine which has found favour on the continent, is based on the inhibitory action of this drug on the sympathetic system. E. Rothlin has shown that the vaso-constrictor effect of stimulating the cervical or splanchnic sympathetic by adrenalin is hindered or annulled by the previous administration of ergotamine, and that uterine contractions produced by adrenalin in the rabbit are also inhibited. Moreover, after the administration of ergotamine experimental adrenalin hyperglycæmia is said not to occur. Dr. P. Sangiorgi has now published[1] a series of ten cases of Graves's disease which seem to have improved a good deal under subcutaneous injections of tartrate of ergotamine, this improvement being maintained for some time after the treatment was discontinued. Tachycardia was the symptom most rapidly influenced, but it also was the first to reappear when administration of ergotamine was suspended. Increase of weight in the patients, who all followed their ordinary avocations, was regarded as a practical demonstration of the behaviour of the basal metabolism under the influence of the drug, and the nervous symptoms were apparently to some extent controlled by the treatment, Sangiorgi's observations being here in agreement with those of J. Bouckaert. In none of the cases, however, did he notice any effect on the thyroid enlargement, when there was any. At first a dose of 0·25 mg. was given every morning; if this was well tolerated it was repeated in the evening. In no case did it seem advisable to exceed a dose of 0·5 mg. daily, and after 20 to 25 days administration of ergotamine was suspended for a week or two, preferably in women, at the time of the menstrual period. After the pause the treatment was then renewed for another period of 20 to 25 days. The first series was considered sufficient to establish the efficacy of the treatment, whilst the second consolidated it. Sometimes, if necessary, after a longer pause a further course of treatment was begun. The general conclusion to be drawn from Sangiorgi's observations if they can be confirmed, is that although ergotamine tartrate is not curative, in the full sense, it may nevertheless have its uses in appropriate cases of Graves's disease. It has also been employed for treating migraine.[2]

LADIES' NIGHT AT THE ROYAL SOCIETY.

THE distraction of a set piece shown at specified times during the evening was absent from the second of the two annual demonstrations of scientific fireworks held at Burlington House this year, and the guests, spared from anxiety lest they should miss the chief item of the evening's entertainment, could examine exhibits, sample refreshments, and greet their friends at leisure. The three occupations offered were equally popular, but since two of them could be happily combined, there was time not only to look carefully at most of the 33 exhibits, but also to supplement the descriptions in the catalogue ("supplied by the exhibitors, who alone are responsible for their accuracy") by cross-examining the long-suffering authors of these simplified statements. Some of them, with the best will, could not at this stage add much to the written word. The exact nature of the resin or balsam, which, with nine times its weight of neutral animal fat, made up the cosmetic found in the tomb of Tut-ankh-Amen will never be disclosed. The very small organism (diameter 0·1 μ) recently discovered by the method of dark-ground illumination with ultra-violet light by Mr. J. E. Barnard, has not yet been named, nor its properties investigated. Still less could Miss M. A. Tazelaar and Prof. Julian Huxley explain the curious influence of temperature gradients on development. By means of a simple apparatus, developing frog's eggs can be subjected to a temperature gradient in any direction required. When the gradient passes from side to side asymmetrical tadpoles may be produced. Cold at the future head end alters the type of gastrulation and may lead to double-tailed monsters. The continuation of normal development outside the body was one of the most attractive demonstrations, shown by Miss Honor Fell, D.Sc., with Dr. R. Robison. At the Strangeways Research Laboratory at Cambridge she has cultivated in vitro the femurs removed from fowl embryos 5½ days and 6 days old. These isolated femurs have a remarkable capacity for self-differentiation. When removed from the body and cultivated in a watch-glass containing suitable culture-medium they may increase to more than three times their original length and at the same time undergo a remarkably normal anatomical and histological development, including ossification. They continue growing for three weeks, after which no further development takes place. As in normal development, the femurs cultivated in vitro form enlarged cartilage cells and osteoblasts and synthesise a phosphatase which may effect calcification by liberating inorganic phosphate from phosphoric esters. When three-day embryonic limb-buds are cultivated they differentiate to form small-celled cartilage; but no enlarged cartilage cells or osteoblasts are formed, nor is phosphatase synthesised. In the annual report of the Lister Institute of Preventive Medicine, which we summarise on page 1373, these results are mentioned as providing strong evidence of the truth of Dr. Robison's earlier conclusion that phosphatase is secreted by the hypertrophic cartilage cells and osteoblasts, but not by small-celled cartilage which never ossifies. The extension of experiments of this kind and of those designed to establish the action of X rays and radium on normal and malignant cells, will soon settle the doubt whether tissue culture represents merely an interesting phenomenon or whether the technique can be developed to yield results fruitful in other sciences.

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[1] Policlinico, June 3rd, p. 774.

[2] See THE LANCET, 1928, ii., 665.

SKIN IMMUNISATION IN TUBERCULOSIS.

As a mechanical method of protection it is obvious that the skin stands facile princeps in the first line of defence against infection. Long ago Robert Koch showed, in the classical experiment known as "Koch's phenomenon," that, once the body had been sensitised by a primary infection with the tubercle bacillus, the skin acquired the power of holding up at the site of inoculation a second dose of bacilli. But the actual value of the skin as an immunising agent has, on the whole, been inferred rather than demonstrated. More recently Prof. A. Besredka showed that vaccines of living organisms, such as staphylococci, applied in a wet compress to the shaved skin of the guinea-pig acted as an immunising agent against subsequent infection, and we have called attention to the significance of this observation. It would indeed be astonishing if the skin, with its blood capillaries under such efficient vasomotor control, did not exhibit immunising powers, but when we come to examine step by step the mechanism of this immunisation, it is by no means easy to determine precisely of what properties this bacterial resistance consists. Phagocytosis is not difficult to demonstrate, but the humoral side of the question is less open to direct experimentation. Dr. P. Woringer, of Strasbourg, in a recent article[1] reviews the evidence for a specific cutaneous immunisation against tuberculosis, based largely on the work of A. Marfan and J. Paraf. Meanwhile remedies based upon the action of the skin as an immunising factor continue to be introduced in clinical medicine, and whatever may be the theoretical explanation of their action there would appear to be good reason for their continued trial.

Prof. A. Wolff-Eisner, of Berlin, in introducing[2] yet another tuberculin into medicine bases his treatment on the belief that these immunological properties of the skin have been hitherto much neglected. Reasoning from the tuberculides he suggests that in cutaneous tuberculosis two immunological reactions take place, first a bacteriolysis of the tubercle bacillus in the skin, and, second, a fixation of the tubercle toxin in the skin which prevents its harmful effect as a circulating toxin (*Winkelriedfunktion*). Santuben, which is a tuberculin ointment manufactured under his control, is claimed to have been used in 16,000 cases during an experimental period before the preparation was put on the market. The ointment is rubbed into the skin for ten seconds once a week. After 24 to 48 hours a slight reddening or swelling should appear at the site of inunction, which remains visible for 3 to 5 days. If the reaction is not obtained a larger inunction is made on the next occasion. Marked erythema is considered to be an overdose and should be avoided. As an adjuvant of this treatment a tablet preparation of guaiacol and silica is administered by mouth, the former for its antiseptic properties, the latter for its supposed effect in promoting the formation of fibrous tissue. After using the remedy in his various institutions of the University of Berlin for 20 years, Wolff-Eisner has obtained a large experience and believes that he can achieve valuable results by cutaneous immunisation in many forms of early tuberculous disease.

THE CENTENARY OF KING'S COLLEGE.

On June 21st, 1828, at a meeting held in the Freemasons' Tavern, with the Duke of Wellington in the chair, a college was inaugurated for the purpose of giving instruction in the various branches of literature and science, and the doctrines and duties of Christianity as the same are inculcated by the United Church of England and Ireland. King's College, London, obtained its Charter a year later, and the centenary of the granting of this Charter is being celebrated this week. On Tuesday last the Duke and Duchess of York opened the proceedings in the College, and on Wednesday the Archbishop of Canterbury dedicated the chapel and opened the library and new wing of the Hostel in Vincent-square. During the hundred years that have intervened King's College has set up faculties in many branches of literature and science, and these have contained an astonishing number of names of world-wide repute. Those of Wheatstone, Adams, Clerk-Maxwell, and Daniell are household words in the basic sciences on which medicine is built up, while the College is hallowed to the student of medicine by the memory of Joseph Lister and more recently of David Ferrier. It is very seemly that one of the Colleges of the University of London should lie within the precincts of the City, and now that the question of a central university site has been decided once and for all there is a wide feeling of satisfaction, we believe, that King's College should continue to occupy part of William Chambers's famous palace. Many of those who parked their cars on Tuesday by permission in the quadrangle of Somerset House, the home of the Board of Inland Revenue, may with the eye of faith have seen the whole edifice tenanted by University students, and some other place found for the servants of the Treasury. One could hope that the bleak stretch of London south of the Thames might acquire some university building of its own, to bring the southern boroughs into more intimate contact with the academic life of a great city. Central London, however, has become progressively less suited for school-children and students' residence. King's College School moved out to Wimbledon Common in 1898, ten years later the hospital nearby was transferred with its attendant school of medicine to Brixton, and the social science department has found a permanent home on Campden Hill. These moves left unchanged the question of accommodation for the students attending the College, the number of whom has doubled since the war, while there are at present over a hundred visiting students from the Dominions and continental countries. The three College hostels in Bayswater, Denmark Hill, and Westminster have long outgrown their accommodation. The last-named of these, lying centrally in Vincent-square and overlooking a first-class playing-field (not, of course, its own), becomes with the new additions one of the best equipped institutions of the kind. The increased number of students has led to the need of larger College buildings, and they can only be partly met by the superstructure over Aldwych Station. The proposal to rebuild the south-west block of the College, with new buildings for anatomy upon the roof, will make it possible to bring together the various departments of the faculty of medical sciences hitherto separated. The estimated cost of all these changes is £125,000, and the money must be found.

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[1] Ann. de Méd., 1929, xxv., 301.

[2] Münch. Med. Woch., 1928, lxxv., 1909.

THE NERVOUS ELEMENT IN CHRONIC CONSTIPATION.

CHRONIC constipation is well called by the Germans a Kulturkrankheit, and is indeed so widespread and in many eyes so serious as to be in danger of taking its place as a definite disease. Perhaps half the patients that a doctor sees describe themselves as constipated and the most far-reaching ills are commonly attributed to this condition alone. All this has a basis of truth, for constipation is undoubtedly the cause of much ill-health; on the other hand, it is very often only a result or symptom of an underlying disturbance. Since the conception of intestinal toxæmia is pretty familiar to the public the fear of constipation looms large in the minds of many and gives rise to much anxiety. The consequent nervous factors in chronic constipation have lately been studied by Dr. Lewent[1] of the University Hydro-Therapeutic Station in Berlin, who finds, like other physicians, that the commonest symptoms complained of are headache, anorexia, lassitude, insomnia, whilst flatulence and abdominal pain are comparatively rare. The great majority of her patients have been women at about the climacteric, and usually the condition has been attributed to "endocrine" disturbance, the cases falling into a large group which she terms the "endogenous" or neuropathic constipation. She recognises also a smaller "exogenous" group largely composed of what would usually be called atonic cases.

A broad division into these two types, "endogenous" and "exogenous," has perhaps as much value in practice as the customary division into spastic, atonic, and dyschezic types. The endogenous group includes that difficult patient, the bowel hypochrondriac, in whom it is often hard to determine how far the symptoms are those of neurosis and how far the result of intestinal toxæmia. The term "intestinal toxæmia" is certainly much abused, and for a large proportion of those who have habitual constipation it is actually less harmful to be constipated than to pass loose stools. In fact it is not definitely known if constipation alone is ever a cause of increased absorption of toxins from the intestine, and everyone is aware that in phlegmatic people an action of the bowel once a week is compatible with perfect health. It will be remembered that Alvarez has shown that many of the symptoms of constipation—irritability, nausea, headache, and so forth—can be caused by mere mechanical distension of the rectum, as, for example, by stuffing it with cotton-wool. Laboratory experiments so far furnish little proof of true intoxication in chronic constipation, for the products of protein putrefaction (indol, skatol, phenol) when given by the mouth or by injection have usually failed to reproduce the symptoms. By giving large doses of such nitrogenous products by mouth Power and Sherwin[2] have produced typical symptoms in man, which leads them to suggest that stasis of the colon may bring about failure of the intestinal wall to detoxicate bodies of this kind, and thus lead to their absorption into the blood unchanged. But their excretion, as judged by the degree of indicanuria, is notoriously unreliable as a guide to intestinal putrefaction, a fact which has led to the suggestion of several alternative tests, including a proposal for the estimation of tyrosin recently made in our own columns.[3]

The whole question cannot be satisfactorily answered at present. It is important, however, that in every case of constipation the relation of cause to effect should be borne in mind; that the relative harmlessness of delayed excretion of solid fæces, as compared to the dangers of fluid motions following the abuse of purgatives, should be remembered; and that reassurance of the patient should never be neglected in treatment.

Lord Donoughmore, treasurer of the Thank Offering Fund for the King's Recovery, organised by King Edward's Hospital Fund for London and the National Radium Fund, has received an anonymous contribution from "Grateful" of 1000 guineas as a tribute to the work of the voluntary hospitals in forwarding the progress of medicine.

THE late Lord Revelstoke has bequeathed £100,000 to King Edward's Hospital Fund, £50,000 to Guy's Hospital, and £25,000 to St. Mary's Hospital Medical School.

ON Thursday, July 18th, at noon, H.R.H. the Prince of Wales will formally open the school buildings of the London School of Hygiene and Tropical Medicine, the new School of the University of London which owes its building to the generosity of the Rockefeller Foundation.

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[1] Med. Klin., 1929, xv., 711.

[2] Power, F., and Sherwin, C.: Arch. Int. Med., 1927, xxxix., 60.

[3] Mutch, N.: THE LANCET, May 18th, p. 1034.

MANCHESTER MEDICAL SOCIETY.—The annual meeting of this Society was held on May 1st in the Medical School of the University, with Dr. R. W. Marsden, the President, in the chair. In connexion with the visit of the British Medical Association to Manchester this year, Dr. Charles Horace Mayo and Dr. William James Mayo, of the Mayo Clinic, Rochester, U.S.A., were elected honorary members of the Society.

IRISH MEDICAL ASSOCIATION.—The annual meeting of this Association was summoned to be held at the Royal College of Surgeons in Ireland on June 12th. A quorum failed to attend within half an hour of the time fixed for the meeting, and the meeting stood adjourned for a week at the same hour and place. On the second occasion those present were able to constitute a quorum, and to proceed with the business. Mr. P. E. Hayden was elected unanimously as President, and Dr. E. Byrne, of Slane, as Vice-President. The President delivered a brief address in which he pointed out the advantages attached to membership of the Association. The report of the Council, which was adopted, stated that at the end of last year there were 409 members, being an increase of 19 during the year.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XXXV.

THE INTERPRETATION OF MENTAL TESTS.

II.*—THE SIGNIFICANCE OF ACCEPTED TESTS.

Mental Tests.

THE systematic testing of the mentality of children for evidence of subnormality and supernormality and for purposes of vocational guidance has become a routine practice in modern educational systems, but anything like a complete test can only be carried out by those who have had experience both in the use of tests and in interpretation of results. The general practitioner, in examining a case of suspected subnormality, may, however, with the use of a few simple tests, obtain sufficient to guide him to a diagnosis not utterly inconsistent with facts, or at least to guard him from giving a prognosis absurdly optimistic. Those given here will not occupy an undue amount of time, and do not require special apparatus.

Binet-Simon Tests.

(*a*) A few tests taken from the Binet-Simon scale serve by their simplicity as a good starting point. If a child of 3 cannot give his full name, know whether he is a boy or a girl, name simple objects shown—*e.g.*, penny, key, knife (closed)—point to his eyes, nose and mouth when asked, and name a few objects in a simple picture he is not up to normal standard. At 4 he should be able to say of two lines which is the longer, the question being repeated with the lines reversed in position (a point of much importance). At 5 he should be able to carry out three simple orders in succession, at 6 should distinguish right and left, and at 7 should repeat the weekdays, and then give the name of the day before any day mentioned to him.

Simple Counting Tests.

(*b*) (1) In order to give confidence to the child, see if he can count consecutively "1, 2, 3, &c.," and how far. It is a purely parrot-like procedure, and has no significance.

(2) Ask him to count aloud different numbers of fingers or pence, using his finger. He should be able to count 4 at 4 years and 13 at 6 years. This process often reveals an utter inability to grasp numbers.

(3) Hold up 2, 3, 4 or more fingers or show pennies and find if he can give the correct answer without counting—that is, find the span of his grasp of numbers. A child of 4 should grasp 4. A failure to grasp more than 2 or 3 at 7 years is very serious.

(4) Simple calculations in addition and subtraction are easily given; the latter always gives the greater difficulty, particularly to the subnormal. The defective's relative inability to deal with abstract number may soon be apparent, so that all calculations have to be done attached mentally to pennies or apples, or in the worst event, can only be done with concrete aids. At 5 years of age there should be the beginnings at least of abstract calculation—*e.g.*, 5 + 2, 4 − 2. There is always a real danger of being too favourably impressed with successes in very simple calculations.

(5) Another useful test is the repetition after the examiner of series of digits: 3 should be repeated at 4 years, 4 at 5, 5 at 6, and 6 at 9. More difficult and of great value for diagnosis is repetition of the digits backwards—3 at 7 years, 4 at 9.

Drawing Tests.

(*c*) A few simple drawing tests may be rapidly carried out. The child may be asked to copy certain lines and simple geometrical forms imitatively after the examiner. A vertical stroke should be imitated at 2, a horizontal before 3, a circle about 3. These imitative performances are always possible much earlier than a copy from an already prepared diagram. A child will not copy a circle from a model until nearly four years, a cross about 4, a square between 4 and 5, a triangle about 5, a diamond at 6. A child who cannot do these at 7—except the diamond—is certainly subnormal, while a child of that age who could not do any or only a few strokes would be an idiot or an imbecile.

Consideration of Results.

Those who desire to carry out a more complete examination will find material for their purpose in the various scales of tests now available—the linguistic Binet type, preferably in the revised forms prepared by Prof. Cyril Burt, Prof. L. M. Terman, or Dr. E. O. Lewis, and the more practical types represented by the Porteus mazes and other performance tests, involving the handling of concrete material. Detailed description of these is beyond the scope of this article. What the examiner is concerned with is the contribution they make to an understanding of the mentality of the examinee. A "mental age" is calculated from the results, and this when expressed as a percentage of the real age gives an Intelligence Quotient (I.Q.), a quantity which remains fairly constant throughout at least the school ages in any one child. As a rough approximation it is true to say that a child with I.Q. below 50 (or even 55) is either an idiot or an imbecile, and will never be able to make his own living or manage his own affairs, and that a child of I.Q. of 50 to 70–75 is feeble-minded and will always suffer from his limitations to such a degree as to be more or less inefficient except under careful supervision.

A bare statement of percentage, however, conveys little knowledge, and the examiner should always endeavour to assess the significance of individual tests. Success in tests of mechanical memory (repetition of digits or sentences), simple school knowledge (naming coins, days, months) should not weigh so heavily in the balance in the child's favour as success in tests which involve rearrangement of ideas, comparisons and abstractions; examples of these are the expression in words of differences and similarities of objects, rearrangement of mixed sentences, repetitions of digits backwards, detection of absurdities, definition of abstract terms. It is in this capacity to form, to compare, to utilise, and to reason about ideas that the higher and therefore the less easily recognisable types of feeble-minded are conspicuously lacking, in contrast to their nearer approach to normality in the elementary processes of perception and memory. Performance tests also, whether the threading of mazes, the fitting of form-boards, the arrangement of blocks of varying sizes and shapes in a given space, the reconstruction of pictures—to instance only a few types—involve an element of arranging and planning, working, however, with concrete material instead of ideas. Some intelligences, both normal and subnormal, are more apt in dealing with the concrete and the mechanical; performance tests are therefore a necessary supplement to the linguistic ones.

It is in so far, then, as these tests reveal something of the mental make-up of the individual that they are of value. But, in estimating future prospects more than intelligence must be taken into account. In the feeble-minded, success or otherwise in after-life will largely depend on temperament; only a fairly well-balanced, stable type can overcome the limitation of intelligence. It is with this group that the examining doctor has much difficulty. In many respects they present the aspect of normality (superficially, at least). They may be brought to the doctor only because a school medical officer has ordered their attendance at a special school, and as it is only special teaching that holds out any hope to these children of making good in after-life, the family doctor will be wise to advise in this direction.

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* Part I. appeared last week.

Sometimes the trouble for which the practitioner is consulted is not so much lack of intelligence as abnormality of behaviour. Symptoms may occur very early. The child of 5 may be already a thief, impulsive, and even violent to a degree, a truant from school, and generally a nuisance. A family doctor may be able to estimate how far this condition has been contributed to by home circumstances and training. Defect of intelligence must be considered as a possible factor and should be tested, but frequently the defect is one of character only. In such cases diagnosis should be deferred. Modern psychology has shown that many children reckoned as having a defect in character—moral defect, that is—are really the victims of subconscious factors. A change of environment, partly for observation and partly for treatment, is desirable, and prognosis should always be very cautious. Where, however, there is a definite history of instability of character from an early age, with offences of many types, and a general disregard of moral codes, moral defect or mental defect of a temperamental type is certainly a probable diagnosis.

EARLY ADOLESCENCE.

At this period, or slightly earlier, just before the child is about to leave school, consultation of the family doctor is not uncommon, for it is often only when the child reaches this stage of life that the parent begins to realise that his child, if feeble-minded, is not as others are, or if he has already to some degree realised this, to suspect that the condition is threatening to remain permanent. His school teachers will probably have given persistently bad reports of progress, and the parent will be growingly aware of a marked lack of capacity and common sense, a lack of initiative and effort, a forgetfulness, a weakness of character, an indisposition to mix with his fellows, a too persistent reliance on his elders.

Reasoning Tests.

In the examination of cases at this age, the evidence of tests is at times singularly negative. Only recently the writer had to certify a lad of 17 who had not come under special attention in his school years as a possible defective, who, on intelligence tests, was almost 12 years in mental age; was certainly backward in reading and very backward in arithmetic, but who, in appearance, bearing, and attitude to the examiner, was obviously a weakling in character, a fact confirmed by his mother's statements. He had committed under influence a sordid crime into which he had simply drifted through his sheer weakness. Even the most advanced tests of the Binet scale only involve a very elementary amount of reasoning and fail to assess types such as this, who, with some mechanical intelligence, lack that reasoning ability which is essential both to the sensible management of one's own affairs and to the adequate control of conduct. Prof. Burt's Reasoning Tests are of much value here. A simple example, adapted to a 7-year mentality, is, "Kate is cleverer than May; May is cleverer than Jane: who is the cleverest." A common type of problem is one in which a variety of alternatives are presented and a choice required. At 10 years, for example, a problem of medical diagnosis is given, the patient being a girl. "If she has a rash, it may be chicken-pox, measles, or scarlet fever; if she has been ailing with a cold or cough, she may develop whooping-cough, measles or mumps. She has been sneezing and coughing for some days, and now spots are appearing on her face and arms. What is probably the matter with her?" Ballard's Absurdities Tests are also useful. "A soldier on the march complained that every man in the regiment was out of step except himself." "The moon is more useful than the sun, for it gives us light in the night when we really need it, while the sun gives us light in the day when we don't need it." It is only exceptionally that tests of this type require to be given; and even the most intelligent of feeble-minded adolescents never get beyond the 10-year level, and usually remain considerably below it.

Apart from tests, the practitioner will usually obtain a fairly solid basis for an opinion from a careful and searching questionaire on the lines already indicated, but especially relating to behaviour and habits now; the fact that he has had work, possibly several jobs, and has lost each through incapacity, will, of course, be very significant. His ability to read and understand a simple passage, and his ability to count may readily be put to the test. He may be questioned about his school or any work he has done, about streets, buildings, mills and factories in the town or district, about places he has visited, and what he has seen there.

By these and similar methods the practitioner will be able to form some idea of his subject's probable ability to make a living on his own or look after himself sensibly, which are the parent's chief interest in the examination. A happy solution, temporary at least, in some of these cases, may be achieved when the parent himself or a friend is able to give the child or youth some simple occupation in which he can be supervised. Where home circumstances are good and the youth's behaviour is not objectionable, institutional care can at least be postponed until circumstances alter. The worst cases, and those of unstable type whose behaviour is uncontrolled and vicious, should have institutional care, but this, up to the present, is in most parts of the country utterly inadequate to requirements.

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H. HERD, M.B., Ch.B. Edin.,
Senior Assistant School Medical Officer,
Manchester Education Committee.

DONATIONS AND BEQUESTS.—Mr. Fred Kershaw, of Starcliffe House, Great Lever, Bolton, on his wife's decease, left £2000 to Chetham's Hospital, Manchester, in memory of his nephews who were killed in the war; £1000 to Bolton Infirmary, in memory of his brother, who was also killed in the war; and £1000 to St. Dunstan's Hostel for Blinded Sailors and Soldiers. Of the ultimate residue he left half to the Bolton Infirmary for the acquisition or purchase of radium; one-eighth to the Cancer Research Fund of the Manchester Royal Infirmary; and one-eighth to the Cancer Hospital, Fulham-road, London.—Mr. David Beattie Ritchie, of West Cumberland-street, Glasgow, left—subject to two life interests—£2000 to Glasgow Royal Cancer Hospital for the promotion and advancement of medical and surgical science relating to the treatment of the disease and of the efficient instruction of students and nurses to cope with the disease; the ultimate residue of the property to Glasgow Royal Infirmary, the Western Infirmary, Glasgow, and the Victoria Infirmary, Glasgow.—About £16,650 passes to charitable objects under the will of Miss Isabella Salmond, the oldest resident of Kirkcaldy, including £3000 to Edinburgh Royal Infirmary and £2000 to Kirkcaldy Hospital.—Mr. Frederick Richard Dixon-Nuttall, J.P., of Ingleholme, Eccleston Park, Prescot, Lancs, left, among other bequests, £2500 each to St. Helens Hospital and the Endowment Fund of the Providence Free Hospital, St. Helens.—Mr. William Jones, of Walter-road, Swansea, left £1000 to the Swansea General and Eye Hospital, to endow a bed in his name; and £250 to Swansea and South Wales Institute for the Blind; and Mr. William George Ayliffe, of Highcliffe, Wotton, Glos, £1000 to Gloucester Royal Infirmary.—Mr. Thomas Ledbrook, of Enham Lodge, Leamington, Warwickshire, left the bulk of £58,000 to charity, including £1000 to Dr. Barnardo's Homes, £1000 for a Warwick cot in Lord Mayor Treloar's Cripple Hospital and College, £500 to the Children's Aid Society, and, after bequests to relatives, all other property equally between St. Dunstan's Hostel, Regent's Park, London, N.W., for Blinded Sailors and Soldiers, the Warneford (Leamington) and Warwickshire General Hospital, and the Royal Midland Counties' Home for Incurables, Leamington.

Special Articles.

PERSONAL AND IMPERSONAL FACTORS IN SCHOOL INFECTIONS.

By G. B. PAGE, M.D. EDIN., D.P.H.,
DEPUTY MEDICAL OFFICER OF HEALTH, COUNTY OF ROXBURGH.

IT is generally agreed that transference of infection is to a large extent a personal matter, the infecting agent being passed directly from one individual to another by droplet infection and contact. No doubt there are exceptions—for instance, protozoal infections that require an intermediate host, but the personal element, direct or by carrier, is paramount for infectious diseases of school-children in this country. For this reason the attention of teachers has been directed to the detection of illness at an early stage and to the necessity of excluding these cases and sometimes their contacts. It is recognised as almost equally important that convalescents should not be readmitted to school until the appropriate period has elapsed, the period in each case being fixed as the result of experience. This provision sometimes brings officialdom into conflict with the parents and the family practitioner, who forgets that the former must legislate for numbers and not for individuals. Thus it has been argued that measles ceases to be infectious after a fortnight and that the common period of exclusion (three weeks) is too long, provided that the child has no obvious catarrhal condition. As a matter of fact, few children convalescent from measles are physically fit to return to school at the end of a fortnight; and who is to judge catarrhs in the numerous cases that have never been attended by a doctor?

In this county head teachers are provided with printed notes, which give in clear language the early symptoms of the common infections and the action to be taken in suspected cases, convalescents, and contacts. Teachers are not asked to make a diagnosis—they are merely asked to exclude sick children from school and to report, on forms provided for the purpose, any infectious trouble which occurs in the school or which may threaten it from without—e.g., a case in the family of a scholar. Teachers are not asked to bother whether a disease is "notifiable" or not, the two main points being that a sick child has no place in school and that any disease liable to spread from one person to another should be reported. Much useful information comes to hand in this way, especially concerning non-notifiable infectious diseases. When a disease is actually prevalent, other returns are called for, but the early intimation and prompt action by the teacher are the points upon which stress is laid.

Attention has been focused on the personal factor in another way: by abandoning, to a large extent, so-called disinfection. It was formerly the custom to carry out "routine" disinfection during the three holiday periods in all schools. This meant that janitors and other more or less uninstructed persons sprayed the schools with formalin and various disinfectants, irrespective of the cleanliness of the building. So great is the public faith in disinfectants, no matter how applied, that this ritual not only gave signal satisfaction but engendered complete confidence and, indeed, was frequently demanded in the face of an outbreak as an effective and necessary preventive measure. For some time past this fetish has been replaced by a higher standard of cleanliness at all times, and in particular by a process akin to the domestic "spring cleaning" at each holiday period. It is probably immaterial whether the school cleaner adds disinfectant to her scrubbing-bucket or not, beyond the fact that most disinfectants leave behind them that coal-tar odour upon which the public has been taught to rely by years of skilful advertisement. It is the cleaning that matters.

The two important points recognised to-day in the prevention of school infections are the exclusion of the sick or potentially sick and a high standard of cleanliness. Actual disinfection by the sanitary staff, and the destruction of books and other articles, may still be thought desirable in certain instances. This is a matter for the judgment of the medical officer and not a routine procedure. As pointed out in a recent circular of the Scottish Board of Health (now Health Department for Scotland) these and similar measures should go a long way towards avoiding the wasteful and inconvenient method of school closure. In fact the Board went so far as to say that closure should never be required in urban areas and rarely in rural districts, where admittedly the school is the chief meeting place of the younger members of the community.

Inanimate Objects and the Spread of School Infections.

It is evident that common drinking-cups might convey diphtheria and that a sucked penholder might convey scarlet fever or exchanged caps ringworm; beyond these occasional and accidental sources of mischief, do book, desks, and other things in daily use convey infections at all frequently? It is not practicable to demonstrate the presence or absence of specific disease germs on these articles, even during an epidemic, but it is possible to examine bacteriologically things used in school and to obtain some idea of the flora they may carry.

For the purpose of this investigation substances were chosen which come into intimate contact with children and, in the case of younger children, doubtless with their mouths. The substances examined were plasticine and glitter-wax, both used for modelling, and sand from a large sand tray used chiefly for geography lessons. The sand originally came from the sea-shore in the north-east of Scotland. Glitter-wax is used for the same purpose as plasticine, but is hard and rather brittle until warmed by the hand. Samples of these substances were collected in sterile containers and examined for micro-organisms, particularly staphylococci, streptococci, and members of the *Bacillus coli* group. The result was largely negative, or the inquiry would have been pushed further. Various culture media suitable for the purpose were used, and I am greatly indebted to Dr. A. Nimmo Smith, lecturer in bacteriology in the School of Medicine of the Royal Colleges, Edinburgh, for carrying out the work.

1. An unused sample of plasticine proved to be sterile.

2. A sample of plasticine that had been in use from three to four months gave the following:—

Surface Results.

Agar plate.	Broth.	Bile-salt-lactose-peptone water.
Six colonies of *Staphylococcus albus*. Seven colonies of *Sarcina lutea*. One colony of a Gram-negative bacillus not fermenting glucose, lactose, or mannite.	No strepto-cocci.	No *B. coli*.

Centre: No growth.

3. A sample of plasticine that had been in use for five or six months in another school also appeared to be free from pathogenic organisms. Cultures from the surface gave a growth of a large Gram-positive coccus of the *Micrococcus tetragenus* type. No streptococci, *B. coli*, or other bacteria were found. Cultures from the centre yielded a pure growth of *B. subtilis*.

4. An unused sample of glitter-wax proved to be sterile.

5. A sample of glitter-wax that had been in use for four months gave the results shown in the following table.

The spore-bearing and almost universally present *B. subtilis* was the only organism grown from the centre of samples 3 and 5 after they had been flamed.

(1) *Surface;* (2) *Centre.*

	Agar plate.	Broth.	Bile-salt-lactose-peptone water.
(1)	*Staph. aureus.* *Staph. albus.* Gram-neg. bacilli, one of the chromogenic bacilli. Growth scanty; staph. not hæmolytic.	*B. subtilis.* No streptococci.	Neg. for *B. coli.*
(2)	No growth.	*B. subtilis.* No streptococci.	,,

6. A sample of sand that had been in use for about four months was treated as follows: (*a*) A small portion was placed in broth and a plate-culture made on agar from the broth after 48 hours' incubation. The plate showed *Bacillus subtilis*, Gram-negative bacilli, and Gram-positive diplococci. No streptococci or staphylococci were found. (*b*) A small portion was placed in McConkey's bile-salt-lactose-peptone water. The culture showed slight acid, but no gas after four days, and on plating out on McConkey's medium there was a growth of three types of lactose-fermenting colonies: (1) a Gram-negative bacillus growing in translucent non-mucoid colonies, (2) a Gram-negative bacillus growing in heavy mucoid colonies, and (3) a Gram-positive diplococcus which was not examined further.

Further fermentation tests with the two Gram-negative bacilli gave the following results:—

—	No. 1.	No. 2.
Motility	Motile.	Motile.
Glucose	Acid and gas.	Acid and gas.
Lactose	,, ,,	,, ,,
Saccharose	Nil.	,, ,,
Dulcite	,,	Nil.
Mannite	Acid and gas.*	Acid and gas.*
Adonite and Inosite ..	Nil.	Nil.
Litmus milk	Acid and clot.	Acid.
Indol	Nil.	Nil.
Gelatin	No liquefaction.	No liquefaction.

* Both are apparently atypical forms of *B. coli.*

This investigation, so far as it goes, confirms the view that inanimate objects do not commonly harbour the germs of disease. With the exception of the sand, the substances examined showed a reasonable degree of bacteriological purity, and even from the sand no actually pathogenic organism was isolated. Of course, any article used in schools might carry infection temporarily, and it is realised that some organisms, such as tubercle bacilli, may exist for indefinite periods in collections of dust and dirt. Furthermore, particular cultural methods applicable to certain organisms might occasionally reveal their presence, although many of those associated with disease do not seem to exist for any great length of time apart from living creatures and organic matter.

A higher standard of cleanliness creates an environment unfavourable to pathogenic organisms, so it may be concluded that this and other common-sense measures (such as individual supplies of books, pens, and plasticine) go far to render the impersonal factor in school infection negligible.

Except in certain circumstances disinfection of schools is probably unnecessary and useless, and the so-called disinfection sometimes practised is "eye-wash," calculated to give the public a false sense of security. The personal factor is the one that really matters, calling for constant vigilance on the part of teachers and officials, together with the enlightened coöperation of the parents.

ROYAL SANITARY INSTITUTE.—As we have already announced, the fortieth congress of this Institute will be held at Sheffield from July 13th to 20th. Next year the corresponding congress will be held at Margate from June 21st to 28th.

GENERAL ELECTION, 1929.

HOW THE UNIVERSITIES VOTED.

BY ALFRED J. GRAY, M.A., B.Sc.,
ASSISTANT SECRETARY, PROPORTIONAL REPRESENTATION SOCIETY.

IN the General Election which has just gone by a large proportion of the medical profession will have voted for a University representative as well as in their own constituency. The system of voting in the two cases has been different and it may be of interest to recall how these differences have arisen. In 1917 an all-party Conference, including members of both Houses of Parliament, was appointed, under the chairmanship of the Speaker, to make agreed recommendations for the Reform Bill then in prospect. From this Conference issued adult suffrage for men and partial adult suffrage for women, now extended to universal adult suffrage. Certain amendments in the method of election were also proposed with a view to ensuring a closer relation between political opinion in the country and its representation in Parliament. It was unanimously recommended that the principle of proportional representation should be applied in the large cities and in thickly populated industrial districts (amounting to some one-third of the present membership of the House of Commons), and in Universities returning two or more members. Further, a majority decision was given in favour of the alternative vote system for the remaining constituencies.

The need for some reform of this nature has been emphasised by the general elections since 1918, notably by the election just held, where more than half the contested seats for the House of Commons were won on a minority vote. But in 1918, Parliament was not prepared to accept any important alterations of the electoral method. The only change made was to adopt proportional representation for University constituencies returning two or more members. These constituencies are now four in number: Oxford, Cambridge, the other English Universities (except London) in one combined constituency, and the Scottish Universities. In 1918, Dublin University likewise elected two members to the House of Commons by proportional representation. Since the formation of the Irish Free State in 1921, Dublin University no longer sends members to the House of Commons, but it still elects its representatives to the Irish Dáil by proportional representation.

One-Member Universities.

Universities in Great Britain include, in addition to those mentioned, the University of London and the University of Wales, each electing one member to the House of Commons. Their experience in the general election may be very briefly described. In each case there were three candidates, and in each case the sitting member improved his position, notably so in the case of Dr. Graham Little of London University, who, in Sir John Gilbert and Mr. W. T. Layton, was faced with two strong opponents. The comparative figures for London University in the two elections in 1924 and 1929 are given below:—

1924.

Dr. Graham Little	(Ind.)	.. 3202	Elected.
Sir J. R. Bradford	(Con.)	.. 2813	
Prof. A. F. Pollard	(Lib.)	.. 1539	
Dr. F. G. Bushnell	(Lab.)	.. 1087	

1929.

Dr. Graham Little	(Ind.)	.. 5869	Elected.
W. T. Layton	(Lib.)	.. 2923	
Sir John Gilbert	(Con.)	.. 2179	

Proportional Representation in the Two- and Three-Member University Constituencies.

The results in the Universities using the proportional representation system may first be examined in their broad outlines, as shown in the following statement.

Combined Scottish Universities.

	Votes.	*Seats.*
Con. ..	15,714 ..	2
Lib. ..	6,698 ..	1
Lab. ..	2,691 ..	–
Total	25,103 ..	3

Quota which ensures election (one more than one-fourth of the votes)—6276.

Combined English Universities.

	Votes.	*Seats.*
Con. ..	4,441 ..	1
Lib. ..	2,231 ..	–
Ind. ..	3,331 ..	1
Total	10,003 ..	2

Quota which ensures election (one more than one-third of the votes)—3335.

Oxford University.

	Votes.	*Seats.*
Con. ..	8,186 ..	2
Lib. ..	3,277 ..	–
Total	11,463 ..	2

Quota which ensures election (one more than one-third of the votes)—3822.

Cambridge University.

	Votes.	*Seats.*
Con. ..	11,425 ..	2
Lib. ..	3,099 ..	–
Lab. ..	1,463 ..	–
Total	15,987 ..	2

Quota which ensures election (one more than one-third of the votes)—5330.

It will be observed that within the somewhat narrow conditions imposed, the result in each case reflects as nearly as possible the political opinion of those voting. In the Scottish Universities, returning three members, the substantial Liberal minority secured one seat, as it has done consistently since P.R. was introduced in 1918. This may be contrasted with the results which prevailed in the interval between the last two Reform Acts, 1884 and 1918. During this whole period, when elections went by majority, the representation of academic opinion in Scotland was purely Conservative. The union of all the Scottish Universities, the addition of one member to their representation, and the introduction of proportional representation, gave the Liberal minority the opportunity of making its views heard at Westminster. In view of the prominent place occupied by the Faculty of Medicine in Scottish Universities, it was fitting that two of the candidates should have been members of the medical profession. Sir George Berry, ex-President of the Royal College of Surgeons, Edinburgh, has been elected continuously since 1918. Dr. James Kerr, a new candidate whose public work in the field of school hygiene is well known, was nominated by the Labour Party.

The Combined English Universities, like the Combined Scottish Universities, have, at each election since 1918, secured a varied representation. Up to 1924, a Conservative and a Liberal were elected. In 1929 the Liberal was displaced by a strong Independent in the person of Miss Eleanor Rathbone, who thereby enjoys the distinction of being the first woman returned by a University in Great Britain. Not only so, she was placed at the head of the count on first preference votes, the Conservative vote being divided between two candidates.

In Oxford and Cambridge the majority party outnumbers the minority, or minorities, by more than two to one, so that even under proportional representation both seats properly fall to the majority party.

Second Preferences at Oxford.

The election at Oxford University may be described in somewhat greater detail as some misunderstanding with regard to it has been publicly expressed. The position of candidates on the first count was as follows:—

Lord Hugh Cecil	(Con.)	.. 6,012
Prof. Gilbert Murray	(Lib.)	.. 3,277
Prof. Sir Chas. Oman	(Con.)	.. 2,174
Total		.. 11,463

Under proportional representation elections are determined not by a majority, but by a quota of votes, this depending on the number of votes cast and the number of seats to be filled. In an election of two representatives, the quota is one more than one-third of the votes, the minimum number which can be obtained by two candidates and not by three. In an election of three representatives, the quota is one more than one-fourth of the votes, the minimum number which can be obtained by three candidates and not by four; and so on.

In Oxford the quota was 3822 votes, and Lord Hugh Cecil was elected at the first count with 2190 votes to spare. In order to transfer this surplus fairly as between the other two candidates, regard was had to the next preferences of all the voters who originally supported Lord Hugh Cecil. Of Lord Hugh Cecil's supporters, eight out of every nine, in round numbers, gave a second preference for Sir Charles Oman, the second Conservative candidate. The exact figures of the votes transferred were, 1938 to Sir Charles Oman and 252 to Prof. Gilbert Murray, placing the candidates as follows:—

*Lord Hugh Cecil	(Con.)	.. 3822
†Prof. Sir Chas. Oman	(Con.)	.. 4112
Prof. Gilbert Murray	(Lib.)	.. 3529

*Elected 1st. †Elected 2nd.

The Conservative voters were thus enabled by the proportional representation system to distribute themselves, as it were automatically, in the most advantageous way. Both the Conservative candidates were now supported by a larger group of voters than was obtained by Prof. Gilbert Murray, and were therefore elected.

It has been said, in reference to this election, that but for the operation of proportional representation, Prof. Gilbert Murray would have been elected. This view is mistaken. Had the election been contested under the method formerly used in the Universities, and which still prevails in a few two-member boroughs, each voter would have had two votes (not one, as under proportional representation) and the great majority of the Conservative voters, 8000 in round numbers, would have supported both Lord Hugh Cecil and Sir Charles Oman. The result would have shown Cecil and Oman at the top of the poll with 8000 votes apiece, and Murray with some 3500, or possibly slightly more.

General Effect of P.R. on University Representation.

It will be seen that the general effect of proportional representation in the Universities has been to broaden the basis of representation. Minorities, which under a purely majority system, would have been in a hopeless position, have been given a fighting chance, and in two of the Universities have succeeded in returning representatives. This result is greatly to the advantage of University representation, which is thereby freed from the charge, to which it was formerly open, of being practically a preserve of one political party.

THE LISTER INSTITUTE OF PREVENTIVE MEDICINE.

RESEARCHES IN PROGRESS DURING 1928–29.

THE annual report for 1928, after noting changes in the personnel of the council and the staff, acknowledges the generosity of other organisations concerned with the promotion of research in giving financial support to individual workers and their assistants. For example, the Medical Research Council furnish the salaries of the staff of the National Collection of Type Cultures, of Prof. Korenchevsky, who is working on the endocrines, and of Miss E. M. Hume, Dr. T. Lumsden and his research assistant, Miss Kohn-Speyer, are endeavouring to work out a method of vaccine treatment for implanted and spontaneous malignant tumours, and are continuing tissue culture experiments, under a grant from the British Empire Cancer campaign.

An account follows of the experiments in progress in each of the six departments of the Institute. Since many of the workers in various departments are concerning themselves with different aspects of the same subject, independently or in coöperation, the range of activity of the Institute is wide. Among the investigations of topical interest is that on

Vaccinia. Methods of Modifying Vaccine Virus.

Prof. J. C. G. Ledingham with Dr. Douglas McClean has demonstrated the possibility of propagating vaccine virus from dermis to dermis of the rabbit by intracutaneous inoculation. In the course of such passage the virus appears to acquire a greatly increased capacity for proliferation in the dermis and a correspondingly diminished capacity for proliferation in the shaved skin. The dermal virus is free from contaminating bacteria and has been cultivated successfully through four generations in vitro by Dr. G. H. Eagles and Dr. McClean, who used the technique of Carrel and Rivers for the culture of the tissues of chick embryo. An increase to 5,000,000 times the amount of virus in the original inoculum occurred.

Considerable irregularity in multiplication of the virus is observed, and that the virus had not changed its character became apparent when lesions before and after cultivation were compared by scarification and intradermal inoculation of the skin of rabbits; moreover, virus propagated in vitro is neutralised by antivaccinal serum from an immune rabbit. Unlike calf lymph, it deteriorates rapidly, even when kept at a temperature of 0°–2° C. There is evidence that changes in oxidation-reduction potential are important factors in this deterioration which cannot as yet be prevented.

During the past winter generalised lesions in the skin and various viscera have been observed among rabbits inoculated with vaccinia at the Institute. All these animals, however, suffered from snuffles, and organisms of the Pasteurella group were isolated from them. Certain of the stock rabbits at the time also showed symptoms of active pasteurellosis. Dr. Ledingham, who is working with Dr. Mary Barrett on this problem, suggests that the generalised lesions following the intravenous inoculation of highly virulent virus, which have been reported by other observers, may be due to activation of latent pasteurellosis in the rabbits by vaccinia and not to the unaided action of the virus itself.

Dr. Ledingham has also studied the "elementary bodies" in vaccine virus which were first described by Paschen in 1906. These bodies ($0{\cdot}2\,\mu$ in diameter) may or may not represent the actual virus, but in any case they deserve more attention than has yet been given them, particularly in view of the fact that the virus in vaccine lymph is held back by bacterial filters.

In the department for the study and preparation of anti-variolous vaccine Dr. A. B. Green has continued his attempts to raise the virulence of the vaccine virus in vitro. Initial experiments have been made in an endeavour to ascertain whether vaccine virus other than a dried preparation can be kept at a high stage of potency at ordinary temperature.

In the course of experimental work on foot-and-mouth disease for the Research Committee of the Ministry of Agriculture, Mrs. Y. M. Gibbs (formerly Mrs. Burbury) has tried the effect of inoculating guinea-pigs with mixed foot-and-mouth disease and vaccinia viruses. It was found that both or one of these diseases might develop unaltered. It was easy to detect foot-and-mouth virus when mixed with vaccinia virus by the generalised vesicles produced by foot-and-mouth virus, but not by vaccinia. The results of these experiments depended largely on whether the part of the skin inoculated was more susceptible to one or the other virus.

An arrangement has been made for the examination (histological and experimental) of any material that may become available from cases of post-vaccinal and other forms of encephalitis by Dr. E. Weston Hurst and Dr. R. W. Fairbrother. These workers are primarily concerned, however, with the investigation of a filterable virus, for they have been appointed under a special grant to embark on research on poliomyelitis in conjunction with five other selected institutes in Europe and America. Mr. Milbank, of New York, has provided £2000 annually for three years to each selected institute towards the cost of this work. Dr. S. Flexner, of the Rockefeller Institute, has generously sent a supply of potent virus.

The histology of the experimental disease in monkeys has been reinvestigated with the aid of improved methods in neuropathological technique.

There is divergence of opinion as to the nature of the cellular reaction, both in monkeys and in the human disease, and most authors believe the lesion to be a primary interstitial inflammation with secondary involvement and destruction of the nerve-cells. The newer silver-impregnation methods devised by Del Rio Hortega have revealed new types of cell in the nervous system; among these the microglia has now been found to play an important rôle in the cellular response to infection with the virus of poliomyelitis. The application of the oxidase reaction has shown that polymorphonuclear leucocytes play a greater part than has been generally believed. Dr. Hurst and Dr. Fairbrother's studies have already shown clearly that the nerve cell destruction is to be regarded as a primary event and not due to the interstitial changes.

In connexion with ætiology their results indicate that coccal organisms are not ætiologically connected with the disease but are most probably air-borne contaminants, though it is possible that organisms belonging to the nasopharyngeal flora may occasionally gain access to the blood stream in the course of the disease. The relationship of the so-called "globoid" bodies to the disease is now being examined.

Attempts made to reproduce poliomyelitis in rabbits so far have failed. Samples of serum from poliomyelitis convalescents, obtained from different sources, have been found to possess neutralising properties; monkeys intracerebrally inoculated with mixtures of serum and virus have remained well. However, no immunity was acquired, since all succumbed to a later inoculation of virus. An investigation into the path of spread of virus in the experimental animal is said to be well advanced.

Experiments in Nutrition.

The water-soluble B vitamins are now definitely established as (1) antineuritic, anti-beri-beri, more heat-labile vitamin B_1; (2) anti-dermatitis, anti-pellagra, more heat-stable vitamin B_2. Miss H. Chick, D.Sc., and Miss M. H. Roscoe have continued their efforts to isolate vitamin B_2 from yeast. Some samples containing vitamin B_2 free from vitamin B_1 have been obtained by the process used (the addition of lead acetate to an extract of washed yeast cells made with acetic acid), but this result was not constant and seems to depend on the relative amounts of the two vitamins present in the original yeast. The properties of vitamins B_1 and B_2 have been studied and differentiated, and their distribution in natural foodstuffs worked out quantitatively by biological methods based on growth response in rats.

Mr. W. R. Aykroyd and Miss Roscoe have made a systematic assay of vitamin B_2 in wheat and maize grains and their constituent parts. These two cereals were chosen because a striking discrepancy in their content of vitamin B_2 might explain the connexion between pellagra and the consumption of maize. Unfortunately for that interpretation, the germ and bran of wheat proved to be fair sources of vitamin B_2 and the immunity to pellagra of people using wheaten bread would seem, therefore, to be due to other constituents in the diet commonly consumed by such populations.

The cereals were found to be poor sources of B_2 compared with yeast and many foods of animal origin, as, for example, liver, egg-white, milk, meat-muscle, and to a less degree, egg-yolk. The results obtained correspond with the relative values of these foods for the prevention and cure of pellagra observed by Goldberger and his colleagues in the United States and thus support their views of its ætiology. Apart from yeast, which contains both factors, the distribution of B_2 seems to be very different from that of B_1.

Rats on a diet devoid of B vitamins will frequently maintain fair health with subnormal growth if allowed to eat their own dried fæces. It has been suggested that these vitamins may be synthesised by the activity of bacteria inhabiting the lower part of the alimentary tract.

Miss E. M. Hume and Miss H. Henderson Smith have completed the biological examination of irradiated zymosterol in conjunction with Mrs. I. Smedley-MacLean, D.Sc., who has discovered this new sterol, and more recently still another unsaturated sterol in yeast. The specificity of ergosterol, in acting as pro-vitamin D, however, remains unchallenged. Experiments to investigate the possible synthesis of ergosterol in the animal body and the occurrence and nature of vitamin A and its relation to carotene are being devised.

Dr. H. Schütze and Dr. Zilva are studying the influence of a diet deficient in fat-soluble vitamins on the development of sensitivity to tuberculin in rats infected with tuberculosis.

Experimental researches on the antiscorbutic principle (vitamin C) are being conducted by Dr. S. S. Zilva for the British Empire Marketing Board.

He is continuing the chemical investigation of the antiscorbutic factor in lemon-juice and is devoting further attention to the study of the cause of the spontaneous inactivation of the vitamin.

Dr. Zilva, Mr. E. Hoyle, and Miss M. F. Bracewell, working on the variation of the antiscorbutic factor in apples, found that the variation in activity is more dependent on the variety of the apple than on its origin. Baking a cooking apple in its skin did not destroy its antiscorbutic activity. Gas storage seems to be less favourable than cold storage to the preservation of the antiscorbutic activity of the apple.

Dr. Zilva, Miss Soames, and Miss Perry have commenced an investigation into the limitations in the accuracy of some of the methods of assay of the vitamins, notably to Hojer's test for vitamin C.

Biological Action of Light.

Sir Charles Martin has tried to determine what proportion of the total radiant energy of sunlight is absorbed by the skin and various fabrics and converted into heat. This can only be indirectly found by ascertaining the proportion scattered and turned back. The absorption through the skin of a number of Europeans with fair and dusky skins was determined and also that of Indians and a negro. The proportion absorbed varied from 65 per cent. in the very fair to 87 per cent. in the negro.

The total solar energy impinging upon the surface of a man of average size is about 4000 calories per minute when the air is clear and the altitude of the sun is 45°. If three-quarters of this is absorbed, this supplement to the heat normally formed in the body at rest would increase the rate of heating fourfold. It is, therefore, understandable how well-browned children at an Alpine sanatorium can run about naked on the snow without becoming cold, although the temperature of the air may be some degrees below freezing point, as long as they are in the sun and there is no wind.

The permeability of the epidermis to radiation capable of activating ergosterol is being investigated by Dr. N. S. Lucas. His observations indicate that the transparency to ultra-violet light of keratin, chitin, and epidermis, which is smaller than that of other proteins, is due to the high content of cystin and aromatic groupings in the former.

The colony of tropical monkeys (marmosets) irradiated with ultra-violet rays continue to thrive and breed, casualties being due to special causes. It is hoped in the immediate future to compare the breeding capacity of marmosets fed on vitamin D with that of those in which the vitamin has been produced by direct irradiation. The squirrel monkeys have not continued to thrive. It is now clear that they require more energetic antirachitic treatment than do the marmosets.

A pneumococcal infection among guinea-pigs being bred for use in the department for the study and preparation of antitoxic sera still persists, but to a diminished extent. On the assumption that the higher incidence of this infection during the early months of the year might be attributable to lack of sunlight, one-half of the breeding stock was regularly irradiated by means of a mercury-vapour lamp, the other half serving as a control. The experiment lasted for one year. No benefit accrued from the light treatment; as it happened, the control stock appeared to give better results both as regards general health and fertility. The improvement in the stock as a whole is probably ascribable to changes in diet, and to selection for breeding purposes of the progeny of animals with a "clean" breeding history, and presumably with a natural resistance to infection with this strain of pneumococcus.

The Experimental Production of Pneumococcal Endocarditis.

Evidence has been obtained by Dr. G. F. Petrie that an infective endocarditis can be readily induced in immune rabbits by intravenous injections of living cultures of a virulent strain of pneumococcus, provided that, in addition, they are subjected to recurring losses of blood by cardiac puncture.

An obvious possible explanation for the occurrence of endocarditis after this procedure is that the slight trauma occasioned by puncturing the heart may facilitate an infective focus, which forms the starting-point of a vegetative endocarditis. The experimental technique was, therefore, modified by substituting for cardiac puncture repeated withdrawals of blood from the jugular vein. Although in a number of rabbits thus treated an amount of blood equal to the total blood volume has been removed, signs of cardiac disease have not so far appeared. On the other hand, a rabbit rendered anæmic by a series of sub-lethal intravenous injections of an anti-rabbit-red-cell serum developed a typical mitral endocarditis which ended fatally. This animal was treated in exactly the same way as those just mentioned except that blood-letting was not practised. From the heart-blood of this rabbit an avirulent variant of the original strain of pneumococcus was isolated.

The experiments suggest that the injurious action of anti-red-cell serum on the vascular endothelium, as well as upon the red cells, predisposed to the infective process. A fresh series of experiments on similar lines has been begun to test the correctness of the theory, which, if confirmed, may throw light upon the pathogenesis of infective endocarditis in man.

MEDICINE AND THE LAW.

Charge of Negligence against a Practitioner.

FOREIGN observers are often laudatory and sometimes critical of the English jury system. If they collect curious instances, they will not omit the recent case of Shewry *v.* Maybury in which twelve laymen were asked to pass judgment upon the propriety of a medical practitioner's diagnosis and treatment of the state of health of an infant child more than eight years ago. The infant's father brought an action against Dr. L. Maybury of Hampshire-terrace, Southsea, complaining that the latter wrongly diagnosed the child to be suffering from congenital syphilis in August, 1920, and unnecessarily and improperly injected a preparation known as "N.A.B." into the longitudinal sinus channel of the head with the result that the child had convulsive fits and is now an incurable mentally defective epileptic. Dr. Maybury in reply admitted that he injected N.A.B., but denied that he was guilty of any negligence or want of skill and said that his treatment was in accordance with the best medical practice. Thus the twelve laymen were asked to perform the seeming miracle of deciding what was the proper treatment in August, 1920, of a child then 14 days old. In this task they were, of course, assisted by the evidence of medical experts, by the arguments of learned counsel, and by the impartial summing up of the judge. But it need occasion no surprise to find that their answers to a string of specific questions failed to furnish a clear reply. Asked whether the condition of the infant plaintiff was caused by Dr. Maybury's treatment, they failed to agree. This being the crucial question, it would seem that the plaintiff failed to establish his case and is left at liberty to bring his action afresh before a fresh jury. But the position is complicated by further questions and answers. Asked if Dr. Maybury believed that the infant had congenital syphilis, the jury answered, "Yes." Asked if Dr. Maybury was negligent in diagnosing that the infant was suffering from congenital syphilis, they answered

"Yes." Asked if he was negligent in deciding on the method of treatment, they answered, "No." Asked if he was negligent in the way in which he administered the treatment, they answered, "Yes, in his general treatment." What the total effect of these answers may be, and whether they furnish ground on which it can be definitely said that the plaintiff has either succeeded or failed—these are matters reserved for further discussion by counsel before the Lord Chief Justice at some future date. It may perhaps be added here that the point was sought to be made against Dr. Maybury that he had not warned the midwife of the child's condition and that consequently she might have contracted the disease and given it to her next patient. It is impossible to know what considerations influence a jury's individual or collective wisdom; but, if such a point had any influence, it would appear that Dr. Maybury's omission to warn the midwife—if he did so omit—was a matter which did not aggrieve the infant or its father so much as the midwife and her future patients. The broad principles applicable to these actions for negligence against medical practitioners are first that the burden of proof is on the plaintiff, and secondly, that, before a doctor can be found to have been negligent, he must have fallen below the ordinary standard of his profession; it does not matter that some other doctor might have done something better nor is it the question whether he has made a mistake. "The jury," as Lord Hewart once said in another case, "should not exact the highest or a very high standard, nor should they be content with a very low standard."

The plaintiff's case was opened to the jury as that of a poor little innocent child blasted at its birth by an incompetent doctor needlessly performing a most hazardous operation. Every mother who read the opening day's proceedings must have thought Dr. Maybury a fiend incarnate. Medical witnesses in support of the plaintiff's claim suggested that the child was suffering from a postnatal condition, and stated that an injection of a solution of arsenic into the brain cells must be immediately destructive, and that it was wrong to treat a child of 14 days with arsenic. Injection of a drug into the sinus vein, it was said, was easy but mistake was easier; the operation had fallen into disrepute because of the possibility of mistake. Medical witnesses for the defence gave evidence which one would suppose no jury could reject. Dr. Maybury said the child was sickly from birth, did not thrive, was feeble and constantly crying; after about a week it developed "snuffles" and a characteristic rash and had jaundice. On those symptoms he diagnosed syphilis; his assistant, Dr. Eberle, agreed with the diagnosis and gave evidence to that effect. Dr. George Riddoch, who was also called, had seen the child in hospital in 1924; he did not believe its condition was due to injections of N.A.B.; the child was apparently becoming worse. Dr. J. J. Abraham, D.S.O., said that in 1920 the injection of N.A.B. into the longitudinal sinus vein was considered the best method of treating congenital syphilis in an infant. He had himself treated 100 to 150 children in that way; he knew of no case of ill-results; it was not a difficult operation; it was incorrect to say that N.A.B. injections were no longer given, or that injection should not be made in the case of an infant 14 days old. If Dr. Maybury's diagnosis were wrong, the injections would not harm the child; he himself used N.A.B. as a tonic; N.A.B. could not destroy the brain if it came into contact therewith; if there had been a deep-seated injury in 1920 from mechanical means, the child could not have survived. Mr. A. L. Abel, F.R.C.S., gave confirmatory evidence; he had examined the child last March and found it a severe but typical case of Little's disease, a congenital ailment. Dr. R. C. MacPherson, medical superintendent of St. Mary's Hospital, Portsmouth, said the child was an imbecile, a typical case of Little's disease with advanced mental symptoms and becoming progressively worse. Dr. F. M. R. Walshe also said the child was a characteristic severe case of Little's disease, with "brutish" features and a rather small head; the child was its mother's first-born child; there had been precipitate birth, a feature of Little's disease. Without going further into the evidence, enough has been said to indicate the obstacles which a jury would have had to surmount before they could have held Dr. Maybury to have been negligent. One might go further and ask whether, if a practitioner is to be found guilty of negligence in the face of such evidence and in respect of an incident more than eight years old, any practitioner could be safe from the hazards of litigation.

Colonel Kynaston and the General Medical Council.

On June 19th a motion was submitted in the High Court on behalf of Col. J. W. Kynaston for a rule *nisi* for a writ of mandamus directed to the General Medical Council. He asked that the Court should call upon the Council to delete his name from the Medical Register at his own request and to erase from the Register all record of the fact that his name had been deleted for professional misconduct. As is probably known, a writ of mandamus is a method of remedying some defect of justice; it takes the form of a command from the High Court to some lesser tribunal or to some body, requiring some particular step to be taken which lies within the functions of that tribunal or body and which is both of the nature of a public duty and consonant with right and justice. If an aggrieved person has no other obvious remedy, he can sometimes have recourse to a mandamus. If, contrary to the famous phrase in Magna Charta, there has been a selling or a denying of justice, a mandamus may issue to put matters right. Col. Kynaston was granted his rule *nisi*, a preliminary step to further argument—this time with the General Medical Council represented—and a considered decision. The point is interesting. Col. Kynaston, if his position is correctly understood from the reports of the recent proceedings, says in effect: "I am perfectly entitled to practise (subject to certain recognised statutory disabilities) without having my name upon the Medical Register: I can decide whether I will be a registered or unregistered practitioner: on a certain date I elected to practise in future as an unregistered practitioner: after I had made that election, the General Medical Council had no right to strike off my name on some other ground." If the writ of mandamus is to issue, remarked the Lord Chief Justice, you must allege that something was done which is wrong in law. It was wrong, replied Col. Kynaston's counsel, to hear evidence about charges after application had been made voluntarily for the removal of the name. Lord Hewart's next question went to the root of the matter. "Do you say," he asked, "that it is contrary to law or natural justice that, where a man, having offended, voluntarily applies to have his name removed, the Council may not say, 'Before we decide whether your name shall be removed at your request, we will look at the circumstances and see whether we shall not remove it in a somewhat different spirit'?" The answer on Col. Kynaston's behalf was that the General Medical Council had no inherent disciplinary power; they had purported to usurp a semblance of discipline by stretching the words "infamous conduct" to mean anything of which they disapproved. At this point, it would seem, Col. Kynaston's advisers were on the fringe of reopening the merits of the Council's decision in their client's case. This line the law-courts have hitherto refused to follow. A practitioner's name may be struck off the Register in the first place if he has been convicted of felony or misdemeanour, or in the second place if he has been deemed guilty of infamous conduct in a professional respect. Chief Justice Cockburn laid down the rule in La Mert's case that the High Court had no more power to review the General Medical Council's decision on a question of "infamous conduct" than to reopen the question whether a practitioner had been rightly convicted of felony or misdemeanour. Lord Justice Lopes quoted this opinion with approval

40 years ago in H. A. Allbutt's case,[1] and the principle thus established has never since been doubted. Mandamus will not be granted to compel the Council to restore a name to the Register if the Council has properly exercised its quasi-judicial discretion in examining a charge of "infamous conduct." Col. Kynaston, therefore, it seems, though he can ask public opinion to declare that he has been unfairly treated, cannot ask the law-courts to reopen the merits of the Council's decision. The High Court has granted him his rule *nisi*, "at his peril," as Lord Hewart observed. If we set the facts and arguments in Col. Kynaston' case entirely aside (since they are subject to judicial consideration) and view the matter in the most general and impersonal way, we see an important issue. The preamble to the Medical Act signifies the expediency in the public interest of the existence and maintenance of a register of qualified medical practitioners. Parliament has entrusted the General Medical Council with a certain authority to preserve professional standards. Is it, or is it not, important that the Register should have some permanent character in the sense that its value should not be vitiated by abrupt and possibly capricious withdrawals? Is it, or is it not, important that, once the Council is seized of an issue relating to professional conduct, its jurisdiction should not be ousted and stultified by the voluntary withdrawal of the practitioner's name from the Register? These are the problems which it may be hoped that the High Court's decision will solve.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The Social Insurance Law.

THE Confederation of French Medical Syndicates has now held its general meeting, the delegates representing 17,000 practitioners, and of course the main subject of discussion was the new social insurance law. Let me briefly recall the history of this measure, at which the French Parliament has been working—if one may so describe it—for nearly ten years. Both Chambers have studied it by means of various commissions, and last year a first text was approved both by deputies and senators. A complementary text, called the "rule for administration," has since been added which is intended to settle all the smaller points that the general law has not touched upon. The whole Act is supposed to come into force on April 1st of next year, by which time the offices are to have everything prepared.

Now let us see what has been happening to the medical profession during this period. Some years ago, just when Parliament was deciding to complete the drafting of the law, the medical profession split into two parts—the old Union of Syndicates and a new Federation of Syndicates. This was the worst thing that could have happened, just when difficult negotiations with the Government were beginning, and it was only last year that the two rival associations united under the title of the "Confédération des syndicats médicaux de France." By that time the Act was already passed, though the "rule for administration" had not yet been considered.

One last explanation is necessary. The new law was voted in haste two years ago just before the general election, and with the electorate in mind. The Government promised at the time that it would come back for revision and modification after the election, but nothing of the sort has been attempted in the two years that have passed since then. The meeting of the delegates of the syndicates was thus faced with a well-defined situation, and strong in its new unity decided on a full campaign for revision of the law. The unanimity of the delegates has shown that the law cannot be accepted in its present form, in which professional discretion, the free choice of doctor and various other items have not been considered in accordance with the wishes of medical men in this country. A fund for the campaign has been started, and every member of the profession in France is asked to send 100 francs.

It is interesting to see that laymen who were somewhat hostile to the profession on this particular question some months ago are now beginning to change their attitude. It was noticeable, for instance, that many newspapers gave the text of the paper voted by the Confederation—a thing they would not have done two years ago. And the Government itself is not quite so confident as it was about getting the law to work next April.

Experimental Syringomyelia.

Dr. Levaditi, of the Pasteur Institute, has succeeded in inoculating syringomyelia into foxes with a filterable virus coming from an epidemic disease isolated from foxes in the United States by Dr. Green. He has shown at a meeting of the Academy of Medicine the slides of the syringomyelic cavities produced in the medulla of the animals, and he thinks it can be inferred that some human cases may be due to infectious disease.

The International Reunion for Neurology, lately held in Paris, was mainly occupied with the study of dystonies, reports being read on Torsion Spasms by Dr. Wimmer, of Copenhagen, and on Spasmodic Wry-neck by Prof. Barré, of Strasbourg. Prof. Wagner-Jauregg, of Vienna, gave a lecture on his method of treating general paralysis with malaria.

The Society of Surgeons of Paris celebrated its twentieth anniversary some days ago. It was started in 1909 for the benefit of surgeons who could not gain admission to the old Société de Chirurgie, which is almost reserved for men belonging to the regular staff of the official hospitals.

AUSTRALIA.

(FROM OUR OWN CORRESPONDENT.)

New Chairs in Sydney University.

GREAT interest has been shown in the contemplated appointment of professors of medicine, surgery, and bacteriology of Sydney University. On Oct. 9th, 1928, Mr. George Bosch, of Sydney, bequeathed to the University a large sum to establish full-time professorships of medicine, surgery, and bacteriology and to endow a department of bacteriology with proper buildings and equipment. The deed of gift provides for the payment of extra remuneration to enable appointees to chairs of medicine and surgery to devote the whole of their time to the duties of their chairs, without the right of private or consulting practice or commercial enterprise associated with the practice of medicine. The donor expressed an earnest desire that the professors so appointed should also act as directors of studies in clinical medicine and clinical surgery, and also direct clinical research. Similarly, the professor of bacteriology must devote the whole of his time to the duties of his chair. It is further provided that, if it should be decided that full-time chairs of medicine and surgery are not in the best interests of the medical faculty, part-time chairs may be re-established at salaries now existing and the extra remuneration not so paid may be devoted to the teaching of research. A committee of the University Senate has been appointed to examine the whole position, and is it not expected that any appointments will be made before six or twelve months.

The Pacific Science Congress.

The following official representatives of the Commonwealth Government and of the National Research Council are attending the Fourth Pacific Science Congress which is being held at Batavia on May 16th: Mr. E. C. Andrews (New South Wales Government Geologist), Mr. G. H. Halligan, Dr. I. M. Mackerras, follows :—Small-pox, 269 under treatment, 10 under observation (last week 301 and 14 respectively), scarlet fever, 1351 ; diphtheria, 1540 ; enteric fever, 12 ; measles, 142 ; whooping-cough, 539 ; puerperal fever, 28 (plus 9 babies) ; encephalitis lethargica, 121 ; "other diseases," 42. At St. Margaret's Hospital there were 22 babies (plus 10 mothers) with ophthalmia neonatorum.

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[1] See THE LANCET, 1887, i., 707; and ii., 1085, 1119.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 4 (1) from enteric fever, 56 (6) from measles, 9 (2) from scarlet fever, 33 (8) from whooping-cough, 19 (3) from diphtheria, 45 (15) from diarrhœa and enteritis under two years, and 33 (9) from influenza. The figures in parentheses are those for London itself.

Liverpool reported 14 deaths from measles, Sunderland 10, and Salford 4. Liverpool also reported 7 deaths from whooping-cough ; no other great town more than 2. Diarrhœa claimed 4 victims in Manchester, 3 each in Liverpool and Leeds. Birmingham reported 4 deaths from influenza. One death from small-pox provisionally assigned to Brighton C.B. should have been reported in the return for the week ended April 20th.

The number of stillbirths reported during the week was 273 (corresponding to a rate of 38 per 1000 births), including 43 in London.

Obituary.

ERNEST MORTON WYCHE, M.R.C.S. ENG., D.P.H.,

SCHOOL MEDICAL OFFICER, CITY OF NOTTINGHAM.

Dr. E. M. Wyche died on June 13th at his residence in Nottingham in his sixtieth year after a very brief illness. He was educated at Oundle School and the London Hospital, and obtained his M.R.C.S. L.R.C.P. in 1893, and after holding various appointments the D.P.H. Lond. in 1898. For 18 months he served as surgeon on a cable-laying ship, and then went into general practice in Cambridgeshire, but on the inception of the School Medical Service in 1908 he was appointed to South Essex, where he had to do pioneer work in a large rural area. In August, 1914, he was appointed senior school medical officer to the City of Nottingham. The service was still in its infancy and Dr. Wyche devoted himself to extension of the work as rapidly as the difficulties of the war allowed. Careful not to encroach on the work of the general practitioner and the hospitals, he attempted to supply those forms of treatment which were otherwise difficult to secure. The expansion of the service after the war soon brought about the necessity for a bigger central clinic, and he was instructed to work with the city architect in adapting a large building to his needs. The new clinic was opened in November, 1926, and is a lasting testimony to his foresight and ingenuity. He was justly proud of the tonsil and adenoids theatre and wards and of the dental department.

We are indebted to one of his intimate colleagues for the following estimate of Dr. Wyche's work. "He followed closely scientific research on the health of young people, and he was always to the forefront in securing for the children of Nottingham the benefits of new advances. A keen enthusiast on the importance of fresh air, he was instrumental in establishing one of the finest open-air schools in the country. He was quick to realise the value of ultra-violet therapy for the ailing child, and his committee was one of the first to instal this treatment. His detailed organising ability, applied to every aspect of school medical work, was especially shown in his scheme for the ascertainment of mentally defective and dull and backward children. A man who avoided personal publicity, he was loved by all who came in contact with him from the youngest of his patients to the highest officials in the town. The members of his staff feel his death most keenly. They have lost not only a respected chief, but also a sympathetic friend."

Dr. Wyche leaves a widow, a son, and a daughter.

Correspondence.

"Audi alteram partem."

THE ESTABLISHMENT OF NORMAL STANDARDS.

To the Editor of THE LANCET.

SIR,—The article by Dr. Lindsey Batten in your issue of June 15th, together with the leading article which it inspired, draws attention to a defect in our outlook that leads to repeated error, illustrated by Dr. Batten's list of old and new "abnormalities" beginning with those aged friends, the retroflexed uterus, the sagging colon and the movable kidney. I was privileged to watch that change of surgical opinion which led to the maxim "never tell a neurotic patient she has a movable kidney," but the maxim was formulated only after much good surgery had been wasted and, to use Dr. Batten's words, "the whole unedifying story repeats itself with a new 'abnormality' and there is no sign that the field is exhausted," for our refinements of technique ensure that an abnormality can be discovered in every neurotic patient. I have before me a report upon a woman, with a history of hysteria going back for years, in which are described elaborate investigations, including the use of the ureteric catheter and duodenal tube, which led to a diagnosis of visceral "trouble" and an outline of treatment winding up with the inevitable course of vaccines. Two surgical operations had previously failed to remove her symptoms, and the excision of a painful scar was now recommended. The evidence of disease was worthless, but to the lay reader of the report the imposing appearance of scientific method concealed the lack of scientific thinking. The patient is now doomed to invalidity.

Such a history is common, but it is doubtful whether the situation would be met by the establishment of physiological standards (which would be left behind by every improvement in mechanical diagnosis). I wonder how medical orators of the future will describe our methods, which involve teaching the student endless refinements of mechanism whilst, in spite of the fact that psychoneurotic complaints are a most serious cause of invalidity, he is left with no clinical instruction in their diagnosis except the pernicious maxim "if you can't find an organic disease you must think of a functional nervous disorder." As we see, modern methods can find an organic disease in anyone. If a candidate at a qualifying examination were asked to examine a patient for the presence or absence of a psychoneurosis he would rightly complain that he had never been taught how to do it ; yet it is safe to deduce that the majority of patients in whom these "abnormalities" are discovered are suffering from psychoneurotic symptoms which, as in the case cited above, are ignored in our keenness for the latest delicacies of mechanical diagnosis. The establishment of standards of mental or "nervous" fitness would be an interesting matter for discussion, but it is plain that we are not ready for it.

I am, Sir, yours faithfully,

Loughton, Essex, June 18th, 1929. MILLAIS CULPIN.

THE PROBLEM OF NEPHRITIS.

To the Editor of THE LANCET.

SIR,—In a description of a case of nephritis which appears in your issue of June 8th (p. 1196) Dr. E. Wordley expresses the opinion that no class of disease would repay better than nephritis a long-continued study over many years. The importance of this remark cannot be too much emphasised though, strange to say, I have not seen this view advanced by any of the able specialists who write on renal subjects. If the various conditions that come under the heading of albuminuria can be properly sifted in the hospital ward or in the laboratory nothing more need be said, as this is being done at present, but if the collaboration of the general practitioner is required no time should be lost in arousing and guiding the research flair which is probably to be found in the family doctor just as much as in the other ranks of the profession.

It is vexatious and humiliating to be brought face to face with cases such as the following and not to be able to give a definite opinion.

A young woman suffered from nephrosis in winter of 1927–1928; has been recently a candidate for Civil Service examination when the urine was quite clear. A young man with brilliant prospects had an attack of nephrosis in March, 1928; albumen persisted for about nine months when the urine became free; after an influenzal attack a recurrence took place and persisted for some time. The urine is now clear.

These are the problems which are continually meeting every practitioner, and it is an opprobrium to medicine that no serious effort is being made to tackle them. Does law or engineering allow itself to be baffled by comparatively simple problems?

I am, Sir, yours faithfully,
Belfast, June 18th, 1929. R. M. FRASER, M.D.

VACCINAL REACTION.

To the Editor of THE LANCET.

SIR,—I recently vaccinated 88 Europeans on a ship bound from India to England. The vaccinations were performed on four consecutive days, and five days after the last was performed the whole group of cases was inspected either by another medical man who was travelling on board the ship or by myself, or (as a rule) by both of us. The vaccine appeared to have taken in 64 cases, or 73 per cent. of the total, and this percentage of successful vaccinations surprised me, because: (1) All the 88 persons had been in countries (chiefly India) where small-pox is an endemic disease. In the 87 cases in which the period of residence in such countries was ascertained its average length proved to be nine years. (2) The average number of previous vaccinations, as stated by the subjects themselves, was 4·7. (3) Two patients had had small-pox some years previously. One of these, who had had it as a child, was among the "takes"; the other, who had had it as an adult, was not. I considered a "take" as something definitely more than the inflammatory lesion to be expected from vaccination with (say) aseptic normal saline.

Nobody would say that on board ship is a place of ideal surgical surroundings, but the other doctor on board considered that I could acquit myself of causing sepsis and that the clinical character of the lesions supported me. The vaccine was from a continental source.

I am, Sir, yours faithfully,
London, June 20th, 1929. G. PRATT BROOKS.

THE "PHYSIOTHERAPY CLINIC" AND THE PRACTITIONER.

To the Editor of THE LANCET.

SIR,—If I may still return to Dr. Matthew Ray's letter in your issue of April 20th it is to bring to your notice, as likely to be of interest, the Comely Bank Clinic, Ltd., Orford-road, Walthamstow, which is run on lines which meet all the objections he raises. The Clinic is a private limited company run by a board which, with one exception (a solicitor), consists of local medical men. This Clinic employs a specialist who attends at the Clinic two days in the week and at other times when necessary. The specialist alone is entirely responsible for treatment, which is carried out by the staff of fully trained and certificated persons under his direction. The doctor sends, or, if he prefers it, brings his patient to see the specialist at the Clinic. No charge is made for the consultation unless the case is considered unsuitable for treatment by electrical or physical methods when the modest fee of 10*s.* 6*d.* is requested.

In this way specialist treatment is secured without the specialist rate of fees, the treatment is carried out by fully trained and certificated persons under specialist direction, and there is no fear of the doctor being deprived of his patient, as the patient never comes into contact with any local practitioner. At the end of the treatment the specialist communicates to the doctor who sent the patient the results obtained and returns the patient to him.

I am, Sir, yours faithfully,
A. POTTINGER ELDRED,
Chairman of Board of Directors,
June 18th, 1929. Comely Bank Clinic, Ltd.

PRESENTATION TO SIR RONALD ROSS.

WHETHER or not the general public is mindful of the immense service rendered to medical science by Sir Ronald Ross, there is ample proof that his colleagues have never forgotten it. Last week two separate societies—one chiefly concerned with the advance of clinical medicine in highly civilised communities and the other with tropical hygiene in its widest aspects—summoned their members together for the purpose of presenting him with tokens of admiration and esteem.

At a meeting of the Royal Society of Tropical Medicine and Hygiene, the newly installed President of the Society, Dr. G. Carmichael Low, handed the Manson Medal to Sir Ronald Ross, who received a great ovation from the large assembly. The President in a brief address recalled the famous researches which had elucidated the whole life-cycle of the malaria parasite. When Sir Ronald began work in India in 1889 he was attracted to the study of malaria, a main cause of death to the people of that country. While in England on leave in 1894 he met Manson and learnt from him the hypothesis—Manson's great induction—that there were stages in Laveran's parasite the purport of which was to infect mosquitoes which sucked the patient's blood. Struck by this idea and stimulated by his talks with Manson, Sir Ronald, on returning to India in 1895, started on the researches, now of world renown, which were ultimately to make clear the true history of the malaria parasite in its passage from man to man. The story of the difficulties, disheartening disappointments, and trying work in a tropical climate, crowned finally by complete success, were to be found in Sir Ronald Ross's memoirs. No one reading this account could fail to appreciate the energy, perseverance, and ability of the man who carried them out. A remarkable feature of the work was that it completely elucidated the whole life-cycle of the malaria parasite, and that it had stood unaltered to the present day. Sir Ronald Ross was the Society's first Vice-President under Manson's presidency, and himself held the chair from 1909–1911. His work had brought him many deserved honours; among them the Manson Medal would surely rank high, for it associated his name with that of an old friend who had encouraged and helped him in trying times. After Sir Patrick Manson's death the Society had founded the Manson Medal to be awarded for distinguished meritorious work in tropical medicine. It would be strange indeed if this medal did not carry the name of Ross as a recipient, for the two names of Manson and Ross would go down together to posterity as the conquerors of malaria.

On the same evening, at a meeting of the West London Medico-Chirurgical Society, Dr. Harold Sanguinetti, who was in the chair, presented to Sir Ronald the Triennial Gold Medal of the Society. Dr. Sanguinetti pointed out that, though the discovery made by Ross was all-important to medical science, it was certainly not a money-making one for the discoverer, who would have done better for himself in the worldly sense if he had discovered a new boot polish. Malaria was not, as was supposed by some people, only a disease of the East. At one time it

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, July 1st.—2.30 to 5 P.M., Medical, Surgical and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M., Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M., Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M., Dental Clinics. 2.30 to 5 P.M., Medical, Surgical, Nose, Throat and Ear Clinics. Operations.

FRIDAY.—10.30 A.M., Throat, Nose and Ear Clinics. 2.30 to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.

ST. PAUL'S HOSPITAL, Endell-street, W.C.

THURSDAY, July 4th.—4.30 P.M., Sir Thomas Carey Evans: Stone in the Bladder with special reference to Treatment by Litholapaxy.

Appointments.

LING, W. H. G. M., F.R.C.S. Edin., has been appointed Hon. Surgeon to the Keighley and District Victoria Hospital.

SMITH, D. S., M.B., Ch.B. Glasg., Certifying Surgeon under the Factory and Workshop Acts for Lesmahagow, Lanark.

STEVEN, ALICE, M.B., Ch.B. Edin., and HOLT, H. M., M.B., B.S. Lond., M.B., Ch.B. Leeds, D.P.H., Asst. Medical Officers of Health, Hull.

King's College Hospital: LIVINGSTONE, G. H., L.R.C.P. Lond., M.R.C.S., and TAYLOR, I., L.R.C.P. Lond., M.R.C.S., Senior Casualty Officers; HALL, V. F., L.R.C.P. Lond., M.R.C.S., House Anæsthetist; HALER, D. H., L.S.A., Resident Assistant Clinical Pathologist; HOSKIN, E. M., L.R.C.P., M.R.C.S., Radiologist; CUMINGS, J. H., M.B., B.S., CUBITT, A. W., M.B., B.Ch., and EASTON, J. H., L.R.C.P., Lond., M.R.C.S., House Physicians; REES, H. L., L.R.C.P., Lond., M.R.C.S., FERRABY, G. S., L.R.C.P. Lond., M.R.C.S., and THORNTON, J. W., L.R.C.P. Lond., M.R.C.S., House Surgeons; MAY, K. S., L.R.C.P. Lond., M.R.C.S., Urological Dept.; ORME, C. R. L., L.R.C.P. Lond., M.R.C.S., Orthopædic Dept.; MACBETH, R. G., M.B., B.Ch., Aural and Throat Depts.; PLAYFAIR, P. H. L., L.R.C.P. Lond., M.R.C.S., and KNOX, H. N., L.R.C.P. Lond., M.R.C.S., Obstetrical and Gynæcological Depts. *Non-Resident Appointments.*—LYLE, T. K., L.R.C.P. Lond., M.R.C.S., House Surgeon to Ophthalmological Dept.; PARER, A. J., L.R.C.P. Lond., M.R.C.S., Junior House Anæsthetist; and NICOLL, D. A., L.R.C.P. Lond., M.R.C.S., Junior House Surgeon to Aural and Throat Depts.

Queen Charlotte's Maternity Hospital: JENNINGS, D. R., F.R.C.S. Edin., Senior R.M.O.; DOLEMAN, F. T., M.R.C.S., L.R.C.P. Lond., Asst. R.M.O.

Victoria Memorial Jewish Hospital: BLAIN, I., F.R.C.S. Edin., Hon. Surgeon; LAMBERT, V. F., F.R.C.S. Edin., Hon. Ear, Nose, and Throat Surgeon; HUNTER, J. W. A., M.B., Ch.B. Edin., Hon. Gynæcologist; and BROCKBANK, W., B.Chir. Camb., M.R.C.P. Lond., Hon. Physician.

Vacancies.

For further information refer to the advertisement columns.

Accrington Victoria Hospital.—H.S. £150.

Birmingham, Dudley-road Hospital.—Jun. Asst. M.O.'s. Each at rate of £200.

Birmingham General Hospital.—Res. Surg. Reg., &c. £100–£140.

Birmingham, Selly Oak Hospital.—Cas. O. At rate of £200.

Bombay Goculdas Tejpal Hospital.—Hon. Surgeon.

Bristol City Mental Hospital.—Third Asst. M.O. £350.

Cardiff, Welsh National School of Medicine.—Jun. Asst. in Med. Unit. £500. Jun. Asst. in Surg. Unit. £350. Also Asst. Lecturer in Pathology. £500.

Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—Sen. and Jun. H.S. £120 and £100 respectively.

Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—Asst. S. Two Chief Clin. Assts. Also Res. H.S. At rate of £75.

Children's Hospital, Balaam-street, Plaistow, E.—H.P. At rate of £50.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—Asst. Laryngologist.

Croydon Mental Hospital, Upper Warlingham.—Second Asst. M.O. £350.

Dreadnought Hospital, Greenwich.—Asst. Radiologist. 50 gns.

Durham County Sanatorium, Holywood Hall, Wolsingham. Locum. 9 gns. per week.

East Suffolk Administrative County.—Asst. County M.O. £625. Also Asst. County M.O.H. £600.

Edinburgh Cogarburn Certified Institution.—Medical Superint dent.

Evelina Hospital for Children, Southwark, S.E.—H.P. At rate £120.

Gateshead County Borough, Mental Hospital, Stannington.—A M.O. £400.

Glasgow, Hawkhead Asylum.—Asst. M.O. £275.

Gloucester, Gloucestershire Royal Infirmary.—H.P. At r of £150.

Golden-square, Throat, Nose and Ear Hospital, W.—Hon. Asst.

Grange-over-Sands, Westmorland Sanatorium, Meathop.—M Supt. £800.

Great Yarmouth General Hospital.—Jun. H.S. £100.

Harrogate Infirmary.—Jun. H.S. £100.

Hellingley, East Sussex County Mental Hospital.—Res. Loc Tenens M.O. 7 guineas per week.

Hospital for Consumption, &c., Brompton, S.W.—H.P. At r of £50.

Hosp. for Sick Children, Great Ormond-st., W.C.—Part-time J Cas. O. At rate of £150. Also Res. M.O. for Country Bran Hospital, Tadworth Court, Tadworth, Surrey. At r of £250.

Hull Royal Infirmary.—2nd Res. H.S., Res. H.S. to Ophth De &c. Each at rate of £150. Also Res. Cas. H.O. At r of £130.

Ilford Emergency Hospital.—Jun. H.S. £100.

Indian Medical Service.—Recruitment of European Officers.

Inverness, Northern Infirmary.—Sen. H.S. Also H.P. and J H.S. At rate of £120 and £100 respectively.

Jewish Maternity Hospital, Underwood-street, E.—Res. M.O. rate of £50.

Kensington Tuberculosis Dispensary, 119, *Ladbroke-grove, W.*—Temporary Tuber. O. 35 gns.

Kidderminster and District General Hospital.—H.S. £150.

London Homœopathic Hospital, Great Ormond-street, W.C. Asst. Surgeon, Surgeon to Mechano-Therapy and Ort pædic Dept. Also Anæsthetist. £50.

Lowestoft and North Suffolk Hospital.—H.S. £120.

Macclesfield General Infirmary.—Res. H.S. £180.

Manchester, Ancoats Hospital—Res. M.O. £150. Also As Pathologist. £200.

Manchester Northern Hospital for Women, &c., Cheetham H road.—Jun. H.S. £100.

Manchester, St. Mary's Hospitals.—Four H.S's. Each at r of £50.

M.A.B. Tuberculosis Service.—Consulting Laryngologist. rate of 200 guineas.

Middlesex County Council.—Tuberculosis M.O. £750.

Miller General Hospital, Greenwich-road, S.E.—Pathologist. £6

Newcastle-upon-Tyne, City Hospital for Infectious Diseases. Res. Med. Asst. £350.

Northern Hospital, Winchmore Hill, N.—Jun. Asst. M.O. £5

Nottingham General Hospital.—Res. Surgeon. £250.

Oldham Royal Infirmary.—Three H.S.'s to Special Depts. Ea at rate of £175.

Portsmouth, St. Mary's Hospital, Institution, &c.—3rd Asst. R M.O. £250.

Preston, Royal Infirmary.—H.S. £150.

Prince of Wales's General Hospital, Tottenham, N.—Hon. Asst. to Ear, Nose and Throat Dept.

Princess Louise Kensington Hospital for Children, N. Kensington. H.S. At rate of £75–£100.

Queen Mary's Hospital for the East End, E.—Hon. M.O. Electro-Therapeutic Dept. Hon. S. for Orthopædic De Hon. P. for Skin Dept. Anæsthetist. 50 guineas. A Cas. O. £150.

Reading Royal Berkshire Hospital.—H.P. At rate of £150.

Rotherham Hospital.—Sen. H.S. £200.

Royal Army Medical Corps.—25 Commissions.

Royal Dental Hospital, 32, Leicester-square, W.C.—Hon. Anæsthetist.

Royal London Ophthalmic Hospital, City-road, E.C.—Two O patient Officers. Each £100.

Royal Northern Hospital, Holloway, N.—H.S. At rate of £70.

St. Albans, Napsbury Mental Hospital.—Jun. Asst. M.O. £4

St. Bartholomew's Hospital.—Asst. Physician and Asst. [illegible] of the Medical Professorial Clinic.

St. John's Hospital, Lewisham, S.E.—Two Res. House Each at rate of £100.

Sheffield Children's Hospital.—Jun. H.S. £100.

Sheffield Royal Infirmary.—Surg. Reg. £200. Also [illegible] H.S., Ophth. H.S., and Asst. Ophth. H.S. [illegible]ch at [illegible]

Shrewsbury, Royal Salop Infirmary.—Res. [illegible] Res. H.P. At rate of £160.

Sleaford, Kesteven Mental Hospital.—[illegible]

Southampton, Royal South Hants and [illegible] H.P. At rate of £130.

Stockport Infirmary.—H.S. Also H.[illegible]

Stoke-on-Trent, North Staffordshire [illegible] £150. Also H.S. to O[illegible] rate of £150.

Swansea County Borough.—Asst. M.[illegible]

Victoria Hospital for Children, Tite-[illegible] At rate of £100.

Swansea Hospital.—H.S. £150.

asey, Victoria Central Hospital.—Jun. H.S. At rate of £100.

ford, Herts, Peace Memorial Hospital.—Res. M.O. At rate of £150.

London Hospital, Hammersmith, W.—Director to Venereal Dis. Dept. £700. Also Aural and Ophth. H.S. and Res. Asst. Cas. O. At rate of £100.

esden General Hospital, N.W.—Res. H.S. At rate of £100. Also Refraction Assistant. 50 gns.

olwich and District War Memorial Hospital, Shooters-hill, S.E. H.P. and H.S. Each at rate of £125.

cester General Infirmary.—General Secretary.

exham and East Denbighshire War Memorial Hospital.—Two Res. H.S.'s. Each at rate of £150.

rk County Hosp.—H.S. Also Res. Anæsthetist. Each £150.

e Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Croston (Lancs), and at Kirkcowan (Wigtown).

irths, Marriages, and Deaths.

BIRTHS.

AKE.—On June 20th, at "Bradesfield," Brundall, Norfolk, the wife of Dr. Eliot Blake, of a son.

AZARUS.—On June 13th, at Lancaster-road, Swiss Cottage, the wife of Mr. Arthur Lazarus, F.R.C.S., of Melbourne, Australia, of a son.

MARRIAGES.

OWN—TAYLOR.—On June 18th, at St. Cuthbert's Parish Church, Edinburgh, James Godfrey Lyon Brown, O.B.E., M.B., Ch.B., Northampton, to Annie Hair, youngest daughter of the late Charles Taylor and Mrs. Taylor, of Woodlands, Markinch, Fife.

VANS—DAVIES.—On June 15th, at St. Columba's, Pont-street, S.W., Dr. Horace Evans, to Helen Aldwyth, daughter of the late Mr. T. J. Davies and Mrs. Davies, of Devonshire-terrace, Hyde Park, W.

ALLINSON—PERKIN.—On June 18th, at St. Luke's Church, Matfield, Hugh Mallinson, M.A., M.R.C.S., L.R.C.P., to Betty, only daughter of the late Mr. F. R. Perkin and of Mrs. Perkin, of Meads, Eastbourne.

UCKLOW—GROVES.—On June 17th, at St. Mary's Church, Lymm, Cheshire, Stuart Leslie Mucklow, M.B., Ch.B., D.M.R.E., to Alexandra Winifred Groves, B.Sc., Ch.B., fourth daughter of Colonel and Mrs. John E. G. Groves, of Dean's Green Hall, Lymm, Cheshire.

HOMAS—WARDLE.—On June 12th, at Leeds Parish Church, Harold Hugh Thomas, L.D.S., of Leeds, to Gretta Mary Wardle, M.D.

HOMPSON—HODGE.—On June 15th at St. John's, Cheetham, Edward Roland Thompson, M.B., Ch.B., to Hilda Mary Hodge, of Farnworth, near Bolton.

ITMAS—COLE.—On June 15th, at Hampstead, Oscar Titmas, L.D.S., of Welbeck-street, W. to Madeline Yvonne, daughter of Mr. A. C. Cole and Mrs. Cole, of Ellerton Lodge, Finchley, N.

UCKER—HOBBS.—On June 21st, at the Church of the Sacred Heart, Bournemouth, P. A. Tucker, L.D.S.R.C.S., of Hereford House, Bournemouth, to Dorothy Mary, elder daughter of Major and Mrs. H. Hobbs, of Bournemouth and Calcutta.

DEATHS.

OWER.—On June 17th, 1929, David Bower, M.D., Springfield House, Bedford, aged 75.

ORLEY.—On June 20th, at Mill Hill, Thomas Simmons Morley, M.D. Lond., of Richmond Park-road, Bournemouth, and late of Barton-on-Humber, aged 76.

ORRIS.—On June 18th, the result of an accident, Barbara Edith May Morris, M.R.C.S., L.R.C.P., only daughter of Mr. and Mrs. E. W. Morris.

B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

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Notes, Comments, and Abstracts.

ENEMIES OF KNOWLEDGE.

Being the Third Stephen Paget Memorial Lecture delivered at the annual general meeting of the Research Defence Society on June 12th, 1929,

BY PROF. A. V. HILL, O.B.E., SC.D., F.R.S.

THERE is a limit beyond which abuse, misstatement, intolerance, and destructiveness must not be allowed to go. I hold no special brief for the medical profession, I realise that doctors, like the rest of us, have their failings, I am aware that privilege and vested interest may make some of them—sometimes—as selfish and intolerant as any. I tell them this at intervals, and admit, as greatly to their credit, that in spite of my abuse they continue to treat me with great friendliness and consideration; perhaps they do not take it too seriously. Gratitude, however, for that friendliness is not the reason why I stand here to-day, to defend them and their colleagues in the laboratories. Rather is it a sense of urgent necessity. When the beneficent work of the Medical Research Council is publicly denounced by a presumably responsible priest, when the use of radium, in the treatment of cancer, is openly described an an imposture by a qualified medical man who claims to have investigated it, and found it worthless forty years ago (9 years before it was discovered !), when the public is implored not to subscribe to hospitals lest its money be spent in torturing rabbits and guinea-pigs, when the greatest of human quests—the search for knowledge for the alleviation of suffering—is held up to obloquy by persons incapable of understanding or appreciating the beginning of what it means, then it is time for a counter-attack to be made. To change the metaphor, diagnosis is a necessary preliminary to cure. Instead of answering preposterous falsehoods merely by denial—a certain amount of mud always sticks, however innocent the victim pelted—one should inquire into the motives and mentality of those who make them. Stephen Paget would have approved of the title of this lecture. His fighting spirit and his generous heart often led him to join battle with those who attempted to hinder the advance of knowledge, and the improvement of medicine and surgery, for the gratification of their own sense of superior wisdom and goodness. I do not propose, however, to-day to discuss only the fantastic opposition of the anti-vivisectionists. Their attitude of mind is only one aspect of a general phenomenon well known throughout history, a mild form of mental disorder, if you will, but one which has expressed itself from time to time in various hideous forms; in cruelty and persecution, in hatred and malice, in the perpetual treachery of hindering mankind in his slow and pathetic efforts to climb the ladder of civilisation.

There are not many who realise the facts of man's gradual evolution; the majority are still inclined to imagine that Adam arrived full-grown a few thousand years ago, with a complete university education and a degree in zoology, in the Garden of Eden, and undertook forthwith the task of naming and classifying the other creatures whom God created for his special needs and satisfaction. Not many properly appreciate, and in some quarters it is almost blasphemy to do so, that in the course of a half million years mankind by a slow and painful process of trial and error has gradually risen from his original low estate. Nature's experiments in living things have been proceeding for hundreds of millions of years: by these experiments creatures of the most varied type had been evolved, to meet the absolute necessities of life, namely growth, maintenance, and reproduction. Finally a type of animal appeared, man's distant ancestor, so designed and constructed that he could become civilised. In an essay in the New Encyclopædia Britannica, "Civilisation," by J. H. Robinson, which some of you may have read, the matter is expressed in a vivid and arresting form. Picture the five hundred thousand years of man's developing culture as compressed into a single lifetime. On this scale mankind needed 49 years to learn enough to desert his primitive hunting habits and to settle down in villages. Half through the fiftieth year a few of the villagers discovered and began to practice the art of writing. The achievements of the Greeks on this scale were in March of this year: Christianity has prevailed since the middle of April: the printing process was invented a fortnight ago: we have been using steam for less than a week, motor cars for a day, wireless for a few hours. Whither is mankind going, on this strange progress? What are the methods of advance? are they inevitable? or can they now be influenced by conscious adjustment on his part? Have we in fact any responsibility in the matter?

Knowledge Makes Civilisation.

There are superior people who affect to despise the degree of civilisation, the modicum of knowledge, the extent of social organisation which have been as yet attained. They would have us abandon scientific research and engineering development as things unworthy of man's high spiritual estate. Such highbrows and unbelievers are useful, not for what they themselves bring to the common fund, but because it is good, even for the best of causes, to have to bear the brunt of criticism. I would not make "Progress" into a false god. Most reasonable people, however, neither believing in magic on the one hand, nor in the inevitability of progress on the other, see in the achievements of mankind, won by patient toil and eager searching, by failure as well as success, by disaster as well as triumph, in sorrow as well as in joy, by courage as well as skill, something to be treated with respect and reverence, something sacred, as we have come to regard human life itself to be. The advance of knowledge is a real and living thing, something worth working for, worth fighting for. That is why we are here to-day. It is true that we are all very stupid and unseeing still—some of us perhaps more stupid than others. We are very far yet from any Utopia, moral, mental, or material; but that the general progress of knowledge has improved man's lot and character and outlook in the last half million years, and that it can continue to improve them in the fifty million that lie before him, is a general proposition that not many will dare to deny. After all, it is knowledge which makes civilisation, *knowledge tempered by reasonable sentiment*, *controlled by decent emotion.* It is knowledge which makes the difference between man and animal: my spaniel Ben is a tangle of emotions, sentimental beyond belief, credulous to the last degree, ready to chase any imaginary cat or squirrel, believing in spooks and probably in "ectoplasm," a very pleasant and interesting companion, but utterly incapable of reaching any great height by his own unaided effort. The capacity for knowledge, for understanding himself and his environment, is man's essential characteristic and his alone: and to deny him the exercise of this fundamental gift would be an unpardonable, an almost unthinkable offence. There is indeed no danger, to-day, of anyone attempting to do so: all governments pay at least lip-service to education and research. The danger arises in the special applications, not in the general proposition—namely, when any specific individual piece of knowledge comes in conflict with vested interests, or tribal prejudices, or inherent conversatism, or even natural stupidity. It is against such prejudices that the fight has continually to be waged. We cannot hold our position by standing still—civilisation must either go forward or go back, and to go forward on some paths, back on others, will probably lead to confusion and disaster. Stephen Paget founded this society "to promote national health and efficiency, to bring about a better understanding of the value of medical and surgical studies, and to expose the false statements which are made against them": and in fulfilling this purpose it is necessary to combat one particular aspect of the spirit of reaction, namely the emotional opposition to the use of animals for experiment. Since, however, anti-vivisection is only a passing phase (one hopes) in the varying follies of mankind, while the fanatical desire to obstruct the advance of knowledge, for one or other cause, is apparently—judging from history—a permanent factor in man's mental constitution, I feel that a Society like ours must view the matter occasionally from the broader aspect and stand, as its name implies, for the defence of research in whatever form that research is undertaken.

"*Anti*"-*Bodies.*

There are many "anti"-bodies, apart from those which save us from disease. Some of them are good, most of them are bad. I cannot bring myself to object to anti-aircraft guns, and there is probably much to say for the anti-saloon league. Anti-dazzle, anti-fire, anti-germ, anti-vibration, anti-waste, and anti-slavery (to quote the telephone directory), all sound beneficent enough. In anti-prohibition, however, anti-socialist, anti-communist, and anti-vaccination we begin to tread on the dangerous ground of propaganda: while in London the anti-mind is revealed, in its highest form, in four separate and independent anti-vivisection societies, all fighting against one another in the same great cause. This anti-mind is no new phenomenon. In my recent researches I came upon an Anti-Rail-Road Journal dated 1835. The Editor claims, as Dr. Hadwen would, that he is "fighting only on the side of truth," "on behalf of some of the most valuable, but least defended interests." This journal contains "an exposure of the Railway System," and it is interesting to record that the list of those who subscribed to a pamphlet "Rail-Road Impositions Detected" is headed by the Provost and Fellows of Eton College, followed by fifteen canal companies, three steam waggon companies, several public houses, and a representative of Messrs. Pickford, carriers. The high ideals professed, and the flowery language employed, by the anti-rail-road enthusiasts of 1835 are so
similar to those of anti-vivisection to-day that the
grounds for the hope that the future of both may be the

It is strange and sad that man, for all his desire for
ledge, his sacrifice and his effort in its pursuit, shou
tormented by this mistrust of what he has been able to
Folly and hatred exist, often in the same mind, side by
with wisdom and goodwill. There is no thesis so ridic
no cause so unworthy, but that some body of zealots w
found ready, in season and out of season, to supp
Cults and movements, rooted in superstition and cred
rear their heads in our midst. There are not many w
not believe in some kind of magic. There is no self-
prophet, no soothsayer or fortune-teller, no food fadd
purveyor of patent medicines or electrical "rejuvena
who cannot, given a little plausibility, secure a follo
How are we to distinguish such cults and movements
the genuine advance of knowledge? Most reaso
educated people will, in fact, be able to distinguish the
but alas, not all people are reasonable or educated;
it is difficult or impossible to give any short defini
which will include wisdom and omit folly. After
nobody has yet supplied—or is likely to supply—a
factory definition of life itself, though most people
recognise a living thing when they see it. True kno
ledge is consistent with itself and ultimately with hum
nature: false prophets can be safely trusted to cut
other's throats: strange cults and movements to neutral
each other's efforts. One must not take these things
seriously. The presence in our midst of weird and wond
ful societies designed to save us from premature burial,
convince us that the world is flat, that "spirits" can
photographed, or even that black is white, adds greatly to
gaiety and interest of life: I for one would treat them kin
and let them have their say. The case, however, is differ
when a lunatic ceases to be harmless and begins to interf
with other people's liberties: we are no longer amused,
shut him up. Individual freedom from molestation is
hard-won basis of modern civilisation. If an individu
offends too grievously in such matters, society retorts
restricting his liberties. So it is with the advance of kno
ledge: freedom of thought and research is the basis of hum
progress: only when these interfere with other peopl
liberties and rights must a check be applied. I have
quarrel with those who choose to believe, as a lady o
wrote me, that "the Almighty never intended that
animal should profit at the expense of another." I may h
that whales, devouring millions of shrimps daily and digesti
them alive (horrible thought!), or tigers strenuously refusi
to live on vegetables, or even fleas or tubercle bacilli, provi
a certain difficulty in her hypothesis; but still, if she likes
believe in it, I have no wish to convince her of another po
of view. After all such beliefs add colour to the world.
situation changes, however, if she tries to interfere with
liberties of my friends and me. If by telling lies and spre
ing calumnies, if by petty persecution in private or malicio
prosecution in the police-courts, if by attempting to forwa
legislation forbidding the use of snails, lobsters and frogs
research, she provides a wanton hindrance to the advance
knowledge, then the matter ceases to be a joke and must
taken seriously; and if, to forward her thesis, she does
hesitate to stop subscriptions to hospitals and to hinder th
work on behalf of suffering fellow-men, then my blood beg
to boil, as Stephen Paget's used to do, and tolerance becom
impossible.

The Psychology of Persecution.

Persecution, the desire to injure or to kill those wh
opinions are different from one's own, is a very old factor
human history. You can see it brutally displayed, oft
under the cloak of religion, in the Old Testament, as well as
later times. You can see it in schools and colleges. F
quently enough it is for non-conformity to some establish
custom, for upsetting some ancient prejudice. The tribe
bound together by certain rites and rituals, by cert
traditional beliefs, and anything which diminishes
authority of these artificial restraints and bonds is held
weaken the tribe and so to justify the persecution of
offender. This faith in established custom is an essent
factor if mankind is to maintain advance already secur
and not to slip back, in times of stress, into barbarism.
must not underrate—however radical our own outlook—
value of conservatism as an attitude of mind, the love
things which they know and have experienced as the ba
of the outlook of common men. Equally, however, we mu
realise that necessary as a brake may be to prevent us fr
slipping down hill, or to stop us when we are going too fa
we can never go forward at all with nothing but a set
brakes, however efficient. And yet in the past (as indeed
the present) mankind has been singularly intolerant of, a
cruel to, those who sought a new point of view and usua
has invoked the name of God to justify the persecuti
I admit—to its credit—that the Anti-Rail-Road Jour
avoided calling upon the Almighty to bear witness to
the purity of its motives; the anti-vivisectionists ha

same compunction. The authorities of Rome and Catholics throughout Europe, many of them people uine *religious instinct* and purity of life, exulted in the ry of 7000 Huguenots on St. Bartholomew's Day in Even in those days the barefaced *massacre of 7000* would have been regarded as discreditable, unless the of God had been invoked. Persecution, torture and were common penalties till quite recently for those with religious beliefs one did not agree: and many things, ing astronomy, could be interpreted as religion.

psychology of persecution is not hard to understand. Barnes, now Bishop of Birmingham, wrote in 1913:

> hen a man of real piety sees the ideas which he venerates , objects which he believes to be holy scorned, he burns a righteous indignation which no mean motive of personal or revenge can kindle. The strength of his conviction with it not only a presage of victory, based on the belief will defend the right, but also the martyr's contempt of is a righteous cause. It is thus that there is no adversary midable as a man sure that he is fighting the battle of the of Hosts, no antagonist so relentless in pursuing opponents who is convinced that it is his duty to make them an able sacrifice to his God.
>
> first sight this intolerance seems to be a noble and fair flower ing from the cultivation of all that is best in the human . Of course even men filled with such fire admit that the for persecution is dangerous: all recognise that a love of and a joy in destruction are among the lower passions of kind, and inferior men animated by such passions are usually instruments by which the righteous secure the conquest of Apart from all ethical considerations the verdict of history ns intolerance as both stupid and criminal. Persecution ever mild a form is usually both a mistake and a crime. It stake because it so rarely succeeds: it is a crime because in of virtue you unchain the baser passions of mankind. success of intolerance is always momentary; its ultimate remains to hamper and distress those who inherit the which it bequeaths.

It is not, however, only in theological matters that intolerance is so rife. In matters of natural knowledge also gives us many examples, though usually here too ligion is invoked as an excuse for intolerance. Vesalius, an atomist, was inspecting with the consent of his kinsman, body of a Spanish nobleman recently dead: the heart a feeble palpitation when divided by the knife. Vesalius denounced to the Inquisition and driven from Italy and before his return. Servetus, also a physician and atomist, was burnt at Geneva for his controversial tings, though it must be admitted that these were usually a theological rather than a scientific character: science theology, however, were harder to separate in those days. uno, the great Italian philosopher of the Renaissance, was soned for seven years by the Inquisition and finally burnt the stake. In 1610 Galileo's propositions that the sun is centre of the world and that the earth rotates daily characterised by a commission of inquiry as "absurd philosophy and formally heretical because expressly trary to holy scripture." By command of the Pope he admonished not to "hold, teach, or defend" the condemned doctrine. His great book, published 10 years later in 32, reaffirmed the Copernican principles of the universe and sed him, in spite of his seventy years, to be summoned to me. Examined under the menace of torture he was ndemned to a period of incarceration and, as a penance, to ite once a week for three years the seven penitential psalms. ey had a sense of humour in those days; I am sure that . Coleridge would condemn Lord Knutsford to some worse nalty than that. After all, do not his friends (or are they . Hadwen's?) pray for our deaths, in general and in ticular, as we have their own written testimony to show; ich is a mean advantage to take if they think that their ayers have any effect. Stephen Paget's death indeed was imed by the anti-vivisectionists as a direct consequence of eir prayers: a postcard to that effect was received by this ciety. No doubt mine will be in due course. The quisition at any rate was more honest: they burnt you if ey could and took the responsibility; they did not try to mmit murder, by proxy, via the Almighty, without risk, oral or material, to themselves. In more recent times than alileo's, the bitterness and folly evoked by the controversy er evolution still linger: there must have been many, ladstone perhaps among them, and certainly several nglican bishops, who would gladly have burned Mr. Darwin d Professor Huxley at the stake, had not that procedure en out of date. There are probably respectable churchers still who would, without regret, offer Dr. Barnes as a crifice in the same great cause of anti-evolution. And yet, -day, to the mass of thinking people, it is perfectly inconivable that Gladstone was right and Huxley was wrong, and at evolution is not a fact, whatever its mechanism may have en.

Religion as a Cloak for Intolerance.

It is strange how often religion, or what is alleged to be ligion, is made the basis of intolerance. To pass from the blime to the ridiculous, even a parish magazine may be used as the vehicle for anti-vivisection propaganda. In the *Parish Paper* of the Church of St. Jude-on-the-Hill (Hampstead Garden Suburb) of May 24th, 1929, the Rev. B. G. Bourchier permitted himself to ask "intelligent people" to take the opportunity of the General Election, now past, to put an end to "the waste of public money" involved in medical research. He protested there against the expenditure of £148,000 during the last financial year by the Medical Research Council. Those of us who know the admirable use to which that money is put, in promoting medical knowledge and therewith the health and happiness of the community, would wish a formal protest to be made against such propaganda in such a place. The reverend gentleman is entitled to hold whatever private opinions he chooses about the personal characters and abilities of those engaged in medical research; the use, however, of his authority and position in the national church as a means of hindering the work of an organisation which is serving mankind at least as well as he is, is a disgrace which the authorities of that church would do well to note. It is as though the Medical Research Council were to permit an attack upon the Church of England and its priests to be launched by one of its junior workers in the pages of a report! It may be said that this is an isolated case. Unfortunately not. In the *British Weekly*, a nonconformist newspaper with an enormous circulation, in the issue of May 16th, 1929, there is a large advertisment by the British Union for Abolition of Vivisection in which it is asked, "Will God allow the interests of Humanity to be served by the violation of His law of compassion? Is His blessing likely to rest upon such barbarities as (1) baking animals in ovens and watching through glass doors to see how long they take to die, (2) tying dogs' limbs over their backs and placing them in plaster-of-Paris and keeping them thus up to 6 weeks, etc."? A woman doctor whom I know, provoked by this advertisement, wrote to the British Union and asked what evidence they had for these alleged atrocities. In reply to her letter a visitor came to see her, who gave the name of Grace Hawkins. Members of the Research Defence Society may remember that in our Journal of the spring quarter of this year there was some amusing correspondence reproduced from the *Hampstead Gazette*. A letter headed "Alleged Animal's Hell," signed by this same Grace Hawkins, had pointed out that "being an artist" she did not wish to defend the ugly headquarters of the Medical Research Association (sic) at Hampstead, but that she desired to call attention to the immeasurably greater ugliness of the work carried on within it. "Within this animals' hell vivisectors of both sexes (what is the implication of this?) perform their experiments upon the quivering bodies of live animals and agonised cries of these helpless victims sometimes penetrate into houses near by, causing great distress of mind": in fact, so great apparently is the distress that "some of the residents and visitors have left the district." These statements were challenged by our secretary, but Grace Hawkins gave as her reason for refusing to publish the facts her reluctance to draw others into the controversy. Anyhow she visited my friend in reference to the advertisement in the *British Weekly*. When asked what was her evidence for the alleged atrocities she said that the first of them was committed by Claude Bernard. It took some time to make her admit, without prejudice to the question of whether he had really performed the experiment, that Bernard was dead these many years, that he had worked in France and not in this country, and at a time when standards of kindness to animals were much lower than they are to-day. Her only defence was finally "how do we know that such things are not going on in England now?" The evidence for No. 2, the tying of dogs' limbs over their backs, etc., was apparently obtained from an anti-vivisection journal! The evidence for No. 3 came from *John Bull*. Grace Hawkins, getting little change out of my friend, remarked that she had always found that women doctors were "harder than men because they are afraid of appearing sentimental." When she left, the lady on whom she had called, wishing to end the interview as pleasantly as possible, thanked Grace Hawkins for troubling to come to explain her point of view, shook her hand and said goodbye with a smile: Grace Hawkins drew herself up dramatically and cried: "Don't smile, don't smile, your smile will haunt me. Oh, sister, may God soften your heart." What can be done with these people except laugh at their eccentricities?

Please do not imagine that I am attacking religion. Among scientists and medical men, among philosophers and thinkers, there are many who view the world from a genuine religious standpoint. Indeed, if religion be regarded as an affair of the spirit, and not as a formal acknowledgment of ecclesiastical authority, scientists and philosophers are probably among the most religious people in the community. They, at any rate, recognise some authority in Nature outside themselves, by whatever name they may call it. They do not parade their religion so openly, and they do not call on God so often to justify, or to hide, their follies and misdeeds. They are perhaps less confident that their particular faith is right.

They know how difficult the problems are. Between true science, however, and true religion there is no conflict. The battle is between science and reason on the one hand, and religion used as a cloak for intolerance and stupidity on the other. It is necessary to say this clearly, for in answer to my protests against this misuse of religion I have no doubt that, under a smoke-screen of abuse, our opponents will trail a red-herring across our path (they will mix their metaphors too) and assert, with pious hands raised to heaven, that I am attacking religion. Well, I am not. I have been attacked before now for not attacking religion.

Libel and Slander.

Perhaps, however, it is a good thing that science and scientific men should be continually suspect by the community whom they serve ; it prevents, to use the lingo of advertisement, "that pontifical feeling" ; it is good for them to be on their defence and not to have their results too readily accepted. Whether it is equally good for the community to discredit its scientists I doubt, but that is another matter. Criticism and hostility, above all, bind them together into a brotherhood. It may not be commonly known, but it is nevertheless a fact, that the Physiological Society was founded 53 years ago, as the direct result of anti-vivisectionist agitation, for the mutual benefit and protection of physiologists. This is one of the great services which that agitation has rendered to mankind. The Physiological Society was the elder sister of the American Physiological Society : its influence on the promotion of physiological knowledge by experiment and thereby indirectly on medicine, has been world-wide. University College is the proud possessor of a Bayliss Fund, which is used to assist physiological research : it represents the proceeds of an action for libel brought by Sir W. M. Bayliss against Mr. Stephen Coleridge ; another contribution by anti-vivisection to medical research. There are not many such good deeds to relate.

I wish I had time to tell you of some of the follies of anti-vivisection which I have been privileged to witness. One I must mention, for it involves Stephen Paget, the founder of our Society. Lord Cromer came to speak to the Cambridge Branch. Sir George Darwin was in the chair. Stephen Paget of course was there. Two old ladies, breathless and with their bonnets all awry, arrived in the hall. I watched them nudging and encouraging each other. At last, when questions were invited, one of them got up and demanded : "Mr. Chairman, is it true that at the Pasteur Institute they make dogs mad by poking them with red hot pokers ?" A difficult question to answer. We shall probably have just such questions to-day. After the meeting Paget and I were talking on the steps outside : he, if I remember right, was smoking a cigarette and blowing the smoke to the sky. The two old ladies rushed up to us and began upraiding him : he turned his face upwards to the heaven (his friends may remember that his face was no common one, and I shall never forget the picture) : he inhaled more deeply from the cigarette : he waited patiently for a pause in the abuse : deep from his inside, his face still upwards to heaven, came a voice—"Madam, I advise you to be very careful in the statements that you make." No more. The old ladies took up the cudgels again and belaboured him—again a pause—a voice still deeper from his inside, his face still upwards to the sky : "Madam, I advise you to be *extremely* careful in the statements that you make." The old ladies could bear it no longer : gathering up their skirts they fled across the square and we saw them no more : I fear they are still anti-vivisectionists.

Perhaps, however, the greatest experience of all was when my colleague, Prof. Lovatt Evans, was accused of stealing dogs for use in his laboratory and I, attempting to draw off some of the enemy's fire, dared to write to the *Times*, pointing out that 40,000 dogs per annum are uselessly destroyed in London alone, with the connivance of the anti-vivisectionists, and that if we could have some, say 1 per cent., of these, there would be no chance of our buying stolen ones. The argument was so obviously pertinent and the result, from the anti-vivisection standpoint, so undesirable that—as I hoped—a flood of abuse descended upon me, much of which was unfit for publication, though it pleased, if not edified, our medical students when it was exposed on the screen. Shortly afterwards my colleague, Professor Verney, was prosecuted for stealing a dog, and a similar flood of obscene abuse descended upon him and upon Sir Gregory Foster, Provost of University College. A month or two later I was reproached by the "English Branch of the World League against Vivisection and for the Protection of Animals," for having tortured my son during my Christmas Lectures at the Royal Institution ! To a foreigner these sound like fairy stories, but they are literally true.

The Path of Progress.

In all lands there are scientific workers : their problems are necessarily the same : their methods are the same : their ultimate appeal to Nature as an arbiter between their theories cannot be different. We are, or we should be—in physi indeed I have good reason to know we are—a great bro hood unbroken by frontiers and national hatreds. It not so for a time after the War, and it is still not so in other branches of science. Only three years ago a scie man of high standing told me, apparently with deep fe that he would rather hinder the progress of knowledge associate with German professors ! If there is one thi the world which should be international it is the purs knowledge, and such a point of view infuriates one no but more than the calumnies of anti-vivisectionists. more common and more dangerous and it is not mitigat any obvious and inherent absurdity. It is a negation of common human factor in civilisation.

There is one last type of intolerance to which I should this is the intolerance of scientific theory. Very often, admitted facts, a theory is based which represents no whole truth but only one aspect of the truth. Beca process follows the laws of conduction of heat it does *follow that it is conduction of heat—other processes* the same laws. Many theories which will explain a li number of facts may prove right when the number of fa increased. Let us admit that evolution is a fact: inconceivable otherwise in face of the evidence. The th of natural selection was put forward to explain the adm facts of evolution. To some that theory has become a do just as hard and unbending as those of religious ortho Science too is apt to have its "Thirty-nine Articles." an attitude of dogmatism is dangerous. To suppose theories are facts, to be intolerant of those who do not b one's theories while admitting one's facts, is to hinder pro from within just as effectively as others can hinder it without. The attitude of the dictator had better be altog avoided. Continual scepticism, both of other peo theories, but more particularly of one's own, is needed are, however slowly, to progress. Such scepticism make us unpleasant people to live with, but it ensures whatever little progress we may achieve is upwards and down.

Conclusion.

One last word. It is possible to hold strong opinions still to be tolerant. We must have theories, and we believe them very implicitly, if we are to progress. A sl accumulation of facts will gradually overwhelm the hun brain, if no means of ordering them be available. We m however, continually reflect upon the possibility that a all we may be wrong. So long as we do nothing unfai other people and *their* theories, so long as we do not inte with *their* liberties in the pursuit of their lawful business, own strong beliefs, our own stupidity and ignorance, may forgiven. Inside the front page of a recent book on phys astronomy a friend of mine has pasted a cartoon of a yo lady talking to an old fisherman : "What did you thin she says, "of last night's wireless lecture on the atom "Never heard such a pack of lies in my life." That, howe is not the same thing as intolerance ; no old fisherman wo wish to burn, to imprison, or even to pray for the death Professor Eddington and Sir James Jeans. I do not m care if the Countess of X, or her friends in the Governme take the same cheerful view that the results of medical resea are a "pack of lies." That is her business, and after all, I bably have the same contempt for many of her sacred beli I am content to leave the decision between us in such matter the public intelligence. What I do protest against, and wo fight against with all my strength, are calumnies and pe cution, and attempts at legal interference with our libert wantonly intended to hinder the advance of knowledge national and political hatreds which prevent coöperation in greatest of human quests ; or theories, however well ground which their owners cannot conceive as being otherwise t true. In such matters, after all, modesty, friendlin humanity, judgment, balanced by a reasonable sense humour are, as in other things, the basis of human welfare

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LIVERPOOL FOOT HOSPITAL.—Since this hospi was opened in October last, 2563 patients have been trea There is a waiting-list of 100 patients a week, and hospital is booked up for the next four months.

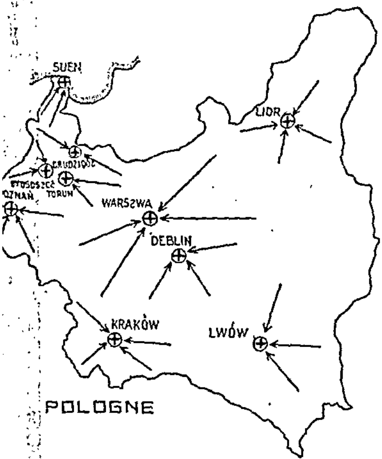
QUEEN'S INSTITUTE OF DISTRICT NURSING.— Executive Committee reports that, instead of one asso tion covering the whole of North Wales, separate associati have been formed for each county. The demands Queen's nurses from all over the country are so numer that great difficulty is being experienced in obtainin sufficient number, though 89 new ones have been enrol Miss Rosalind Paget reported that during 1928 the Quee nurses and village nurse-midwives attended 85,077 ca with a maternal death-rate of under 2 per 1000.

AMBULANCE AEROPLANES.

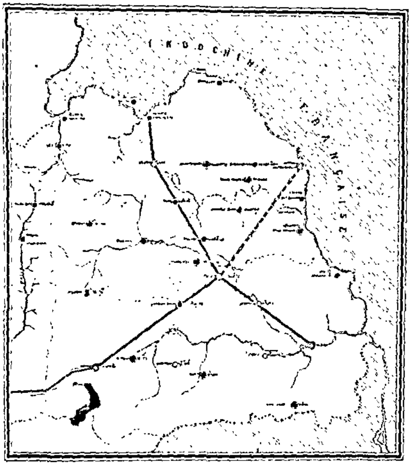
The demonstration of ambulance aeroplanes during the ternational Congress of Sanitary Aviation, to which our aris correspondent recently referred, was instructive in negative as well as a positive way. Very few countries st ambulance aeroplanes—an omission which will doubtless made good in a few years, when the authorities concerned alise what scope there is for useful give-and-take in this ld. In Britain, as Air Vice-Marshal David Munro reminded e Congress, not much use has been made as yet of aeroplane nbulances for transporting urgent cases to hospital. The asons for this are manifold. One is, that communication road or rail is for the most part good and rapid, and stances are not great. Another is, as Dr. Munro had admit, that weather conditions are often bad, particularly regard to visibility. Nevertheless, he was satisfied that oner or later aeroplanes would be used for transporting e sick from remote places such as the Scottish islands, here both the population and the opportunity of medical lp is scanty. Unfortunately, such services are costly and meone must pay for them. Outside Britain aero-transport already in use in Australia and in Mesopotamia; in e latter it is the ordinary method of evacuating the sick means of R.A.F. aeroplanes transformed to carry retchers. The French, however, were the first to utilise ch specially constructed air ambulances, and Dr. Munro pressed his admiration at the success of such aerial transrt in military operations in Morocco and Syria.

Poland.

Sanitary aviation in Poland begun in 1924 with the nversion of an army aeroplane of the Albatros C.X. pe into an ambulance aeroplane, capable of carrying e lying case in addition to the pilot. In 1928, in Warsaw, committee was created for the promotion of sanitary iation. The Polish National Red Cross Society has underken the task of organising sanitary aviation. At the esent time there is a network of stations available for the bulance aeroplane, the Warsaw station, with a radius action of 200 kilometres, possessing ambulance aeroplanes the Hanriot and Bréguet types. Other stations, with adius of only 80 kilometres, are provided with Hanriot oplanes. This service is at present limited to patients o are badly injured or very ill. In an appeal for the vices of an ambulance aeroplane, the diagnosis of the plaint and the name of the doctor responsible must stated. In doubtful cases the chief medical officer the station concerned decides whether an aeroplane to be sent or not, catastrophes or unseen accidents epted. Telephone calls for an ambulance aeroplane are given precedence, even before official communications. According to the statistics of five stations compiled in March, 1929, 41 persons had been carried a total distance of 8260 kilometres. The station of Cracow was called on in 1928 for the services of an ambulance aeroplane 19 times, the distances to be traversed ranging from 30 to 160 kilometres. Some appeals had to be refused either because the distances were too great or the hour of the day too late. There were no landing accidents, although these landings were impromptu. In the winter skis were used in the place of wheels.



p of Poland showing the network of stations available for the mbulance aeroplane. Scale about 250 km. to the inch.



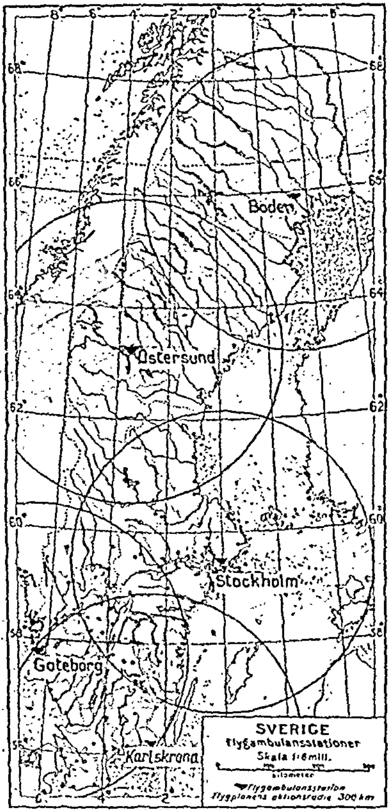
Map of the eastern provinces of Siam showing air lines in use or proposed (dotted). A white cross denotes an aerodrome with ambulance planes, a black ringed circle a landing ground in being, a black dot one under construction. Scale about 200 km. to the inch.

Siam.

In the north-eastern part of Siam lack of highways and the rainy season render automobile traffic most difficult. The time taken to travel 200 kilometres by the ordinary means of transport—the bullock cart—is about ten days. The Government has, accordingly, provided this part of Siam with a regional, central aeroplane station and various subsidiary stations. Sick persons desiring medical treatment in Bankok can hire ambulance aeroplanes at the rate of one tical per kilometre, no charge being made to poor patients. Before the introduction of an Air Mail Service in the north-eastern province, drugs and medical supplies took long to reach their destination and were liable to suffer mishap during terrestrial transport. As early as June, 1921, the Department of Public Health employed an ambulance aeroplane to convey doctors and medical supplies to a distant area where a serious epidemic had broken out. The success of this venture, which saved many lives, induced the authorities to arrange for the conveyance by the Air Mail Service of medical requisites for combating epidemic disease in human beings and domestic animals. It is reported that, since this arrangement was made, the serious outbreaks which used to occur have ceased. The ambulance aeroplanes in use are adaptations of the Bréguet type fitted with a 300 h.p. Renault engine. With a speed of 120 to 160 kilometres per hour, these aeroplanes, which carry two lying or four sitting cases, can remain in the air for three to four hours. There are now ten ambulance aeroplanes attached to the different air stations.

Sweden.

A Swedish ambulance aeroplane which had flown from Malmö to Paris attracted much attention at the Congress, and the thoughtful and generous provision of literature on the subject enabled delegates to pocket for future use some of the information they did not assimilate at the time. A trial flight impressed one with the comfort and warmth of the interior, and with the smoothness with which the aeroplane landed. The Swedish Red Cross Society started as early as 1923 to develop sanitary aviation, beginning with a French Bréguet aeroplane, a biplane fitted with a 12-cylinder Renault engine. The actual transport of patients by air began in the summer of 1924, and no accident has happened, although since then, from one station alone, that of Boden in the north of Sweden, as many as 126 patients have been transported, including those suffering from enteric fever (15), pulmonary tuberculosis (14), appendicitis, with or without peritonitis (17), and 16 obstetric cases. The Bréguet failing to wear well in the rough climatic conditions of the North, a Junker aeroplane was obtained, with a radius of action of 500 kilometres. Provided with floats and skis, and made entirely of duraluminium, the interior is heated by air which has passed over the exhaust tubing. The cost was kr. 85,000. This aeroplane has been stationed at Boden since 1926. For more than a year, a society (Luftfartsförbundet) has existed in Sweden with the object of promoting aerial navigation, and one of its aims is to develop sanitary *aviation. In December, 1928,* it presented the Swedish Red Cross with kr. 60,000 for the purchase of an ambulance aeroplane to be stationed south of Boden. It has also given kr. *50,000 for another aeroplane to be stationed* near Stockholm. When Goteborg and Karlskrona are similarly *provided*, Sweden will be served with ambulance aeroplanes within reach of every part of the country.



GENERALSTABENS LITOGR. ANSTALT STOCKHOLM 1929

Map of Sweden showing the aviation centres and their range of action covering the whole country.

THE DANGERS OF LIFE IN THE TROPICS.

THE experiences of one who has not only travelled widely in the *tropics* but has worked there as an active investigator of local diseases can hardly fail to be of interest. Dr. Torrance describes his African and Asian journeys and supplies maps to show the routes taken. In Africa, he passed from Angola to Mombassa in the middle *south, and* in the middle north, from Kenya to Gambia; while in Asia he sampled Burma, Annam, Siam, Malay States, Sumatra, and Borneo. His book is addressed rather to the laity than to the medical profession, and he *deserves congratulation* on the simplicity and freedom from technicalities of his accounts of tropical diseases such as malaria, yellow fever, trypanosomiasis, relapsing fever, dengue, *and cholera.* He gives the history of the curative measures adopted for each at different times. These medical details are *interwoven* with tales of big game, native dances and other adventures, some of which are exciting enough. Those *who like swatting* flies will appreciate his notes on "man-handling the mosquito." The first chapter, in defence of the big jungle beasts, points the moral that, dangerous as these may be, they are no more dangerous than the insect perils that beset all travellers in the tropics. A useful table of the important tropical forces, their transmitter, geogra *distribution,* and diagnosis completes a book which meditating a sojourn in the tropics, might well read they start.

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[1] Tracking Down the Enemies of Man. By Alfred Torrance, M.D. Lond. London: Alfred A. Knopf. 1929. Pp. 319. *7s. 6d.*

SYNTHETIC SUBSTITUTES FOR NATURA PRODUCTS.

IN the course of an address on the Changing Found of Materia Medica, delivered in Dublin on June 2 the annual meeting of the British Pharmaceutica ference, Mr. R. R. Bennett, the chairman, commen substitution of synthetic for *natural drugs. He* p out that among the achievements of recent years ha the replacement of the active *principles of certain* r products by identical substances synthetically pr at a cost which compares *favourably* with that natural article. The price of synthetic thyroxin that of the natural product obtained from the thyroid The replacement of natural ephedrine by the sy product has been attempted, but the latter does not the same *therapeutic activity as the natural* al Both in the animal and the vegetable world Nature her syntheses within a very small range of temp and with very mild reagents. Fusions with alkali, ment with powerful dehydrating agents, *and seale* reactions under pressure are unknown to her. The sy of the laboratory are invariably performed in a which would destroy the apparatus in which natur ducts are formed. Nature also possesses the se optical activity and leaves to Art the synth optically inactive forms only; but most of these o inactive forms can now be resolved. Mr. Bennett mented on the number of drugs possessing valuable cinal properties which are obtained solely by sy chemical processes. The great advances in sy chemistry were remarkable in view of the fact that century ago a sharp distinction was drawn betwe inorganic and the organic world. The discovery that substances, previously supposed peculiar to the tis living beings, could be prepared in the laboratory h a profound influence on pharmacy and during the that elapsed between. The centenary of the synth urea by Wöhler in 1828 has recently been commem Wöhler by heating potassium cyanate with amn carbonate produced the substance urea which pre had been known only as an important constituent o Between the synthesis of urea and that of thyroxi numbers of organic compounds of immense importan been synthesised.

A DIRECTORY OF BRITISH CHEMICAL

A DIRECTORY of British chemicals[1] last issued in 19 now been revised and brought fully up to date, the in being that an edition shall appear every second ye contains a full list of members of 117 firms and 13 a associations with a classified list of British chemicals note of their uses. The catalogue is printed in five lan other than English, the products being classified alp cally in tabular form from Acenaphthene down to Zin salts in English; the name of the product in other lan follows an alphabetical key table in each language, it easy for foreigners to find their way about the cat At the end is a list of proprietary and trade names, which Tartar is included as a "tar preparation for

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[1] British Chemicals: Their Manufacturers and Uses. the Official Directory of the Association of British Cl Manufacturers (Incorporated). Published for the Associat Ernest Benn, Ltd. 1929. Pp. 330. 10s. 6d. net.

MEDICAL GOLFING SOCIETY.—The summer m was held at Walton Heath on June 20th, when Lord entertained the competitors as his guests. The were as follows:—THE LANCET Challenge Cup: H. Ga Hill, 2 up; T. P. Kolesar, all square. Henry Morris lenge Cup: F. Rose, 2 up; R. Lindsay Rea, L. W. Bat Sir Milsom Rees, A. Gallately, each 1 up. Milsom Challenge Cup: F. Rose. Veterans' Cup (present Sir Kenneth Goadby): F. Rose. Sealed Handicap George Dawson's prize): A. Soper, 1 up. Class prize: A. C. Palmer, 3 up; 2nd prize, Sir Milsom and A. Gallately, 1 up; T. P. Kolesar and D. Jacks square; best last nine holes, T. Stordy. Class II prize: F. Rose, 2 up; R. Lindsay Rea and L. W. Bat 1 up; J. Ligat, all square; best last nine holes, W. Davies, 1 up, after tie with L. W. Bathurst. Fours C. Ma[illegible] Sir Stanley Hewitt, 3 up; E. Li Evans and M. L. Trec[illegible]